

# JOURNAL

OF THE

## AMERICAN VETERINARY MEDICAL ASSOCIATION

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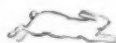
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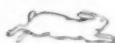
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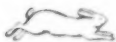
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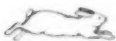
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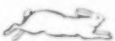
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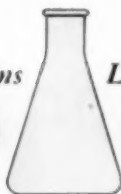
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# AVMA ☆ Report

## Veterinary Medical Activities

◆ The month of January, as usual, saw AVMA officers and staff members attending several of the many association meetings and conferences which are regularly held during that month. The schedule of the meetings attended follows:

President W. L. Boyd appeared on the programs of the:

University of Pennsylvania Conference of Veterinarians, Philadelphia, January 6-7. He also spoke to the student chapter.

Cornell Conference for Veterinarians, Ithaca, N. Y., January 8-9

Indiana V.M.A., Indianapolis, January 14-16.

Minnesota V.M.A., Minneapolis, January 26-27.

Illinois V.M.A., Chicago, January 29-30.

President-Elect J. A. McCallam spoke at the meetings of the Oklahoma V.M.A. in Oklahoma City, January 12-13, and visited the Tri-State (Mississippi, Arkansas, Tennessee) meeting in Memphis, January 13-14.

Editor W. A. Aitken was on the program of the Intermountain V.M.A. in Salt Lake City, January 19-21; he went on to the midwinter meeting and conference of the California V.M.A. in Davis, January 26-28.

Executive Secretary J. G. Hardenbergh attended the annual meeting of the Iowa V.M.A. in Des Moines on January 20-22, at which time he presented one of the Humane Act Award certificates for which John Moody of Des Moines was selected by the committee last summer.

The assistant executive secretary, Dr. C. D. Van Houweling, represented the Association at the Ontario Veterinary Association meeting in Ottawa on January 14-16. After the O.V.A. meeting, he met with the Local Committee on Arrangements for the AVMA convention in Toronto, July 20-23, 1953.

★ ★ ★

◆ Dr. W. R. Krill represented the AVMA at hearings, held in Washington, D. C., on December 15, on special pay for certain members of the Armed Forces (*see* p. 138, this issue).

★ ★ ★

◆ The Central Office staff held a Christmas luncheon on December 24, made possible by personal contributions from Executive Board members. The staff gratefully acknowledges this gift from members of the Executive Board.

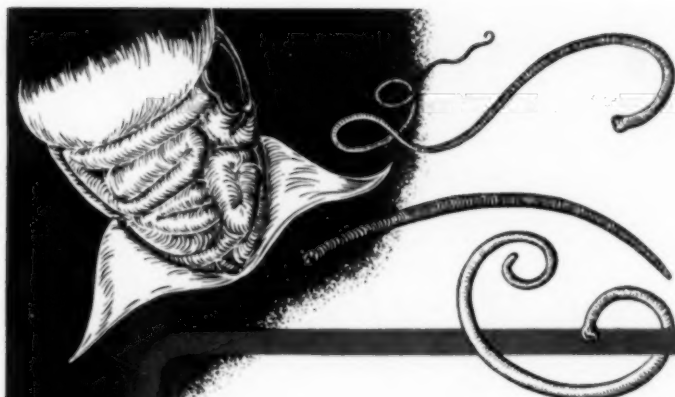
★ ★ ★

◆ A Committee of the Executive Board has been appointed to study the method of appointment, tenure, duties, and need for AVMA standing and special committees. Their report will be submitted to the Executive Board and the House of Representatives.

★ ★ ★

◆ The Research Council at its Nov. 30, 1952, meeting elected Dr. L. C. Ferguson (Ohio State University), as chairman, Dr. R. D. Turk (Texas A. & M. College), vice-chairman, and Dr. Robert Getty (Iowa State College), secretary. The Fellowship Committee will consist of the council officers plus Drs. C. A. Brandly, C. H. Cunningham, M. A. Emmerson, and James Farquharson.





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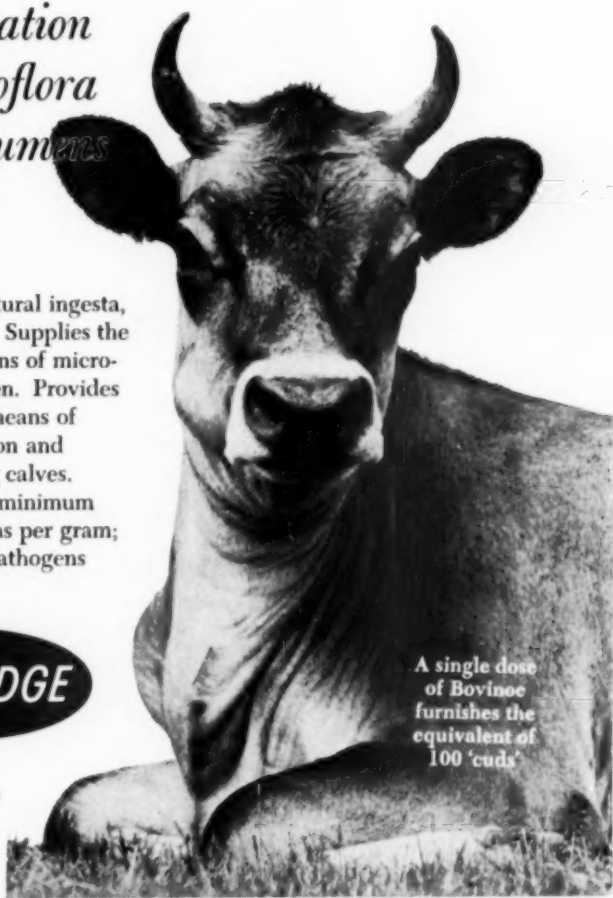
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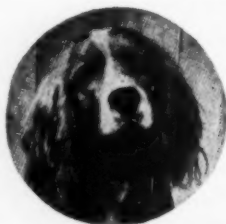
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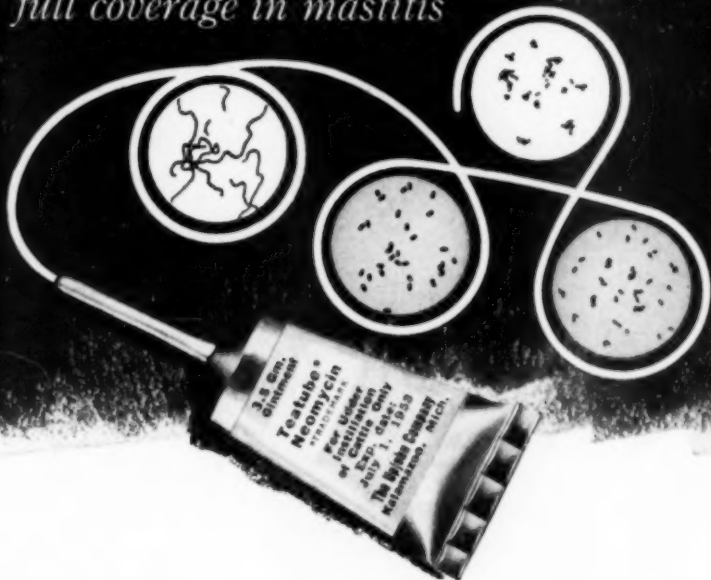
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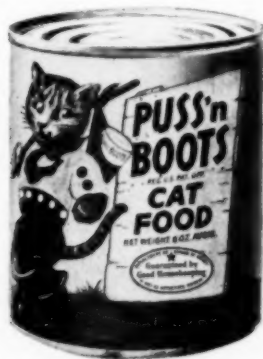
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## Canine Actinomycosis A Report of Two Cases

ROBERT W. MENGES, D.V.M.; HOWARD W. LARSH, Ph.D.;  
and ROBERT T. HABERMANN, D.V.M.

Kansas City, Kansas

THE FIRST cases of an actinomycotic disease in dogs were reported by Vachetta (1882),<sup>1</sup> Rivolta (1884),<sup>2</sup> and Rabe (1888).<sup>3</sup> Bollinger<sup>4</sup> had already described actinomycosis in cattle in 1877, and Harz<sup>5</sup> had named the organism of the disease in cattle *Actinomyces bovis*. In 1891, Wolff and Israel<sup>6</sup> first cultivated *A. bovis*, adequately characterized it, and demonstrated its pathogenic action.

According to the present-day concepts of some workers,<sup>34</sup> actinomycosis should refer only to the disease which is caused by the anaërobe, *A. bovis*, in which granules are characteristically, but not invariably, present. Other workers<sup>35</sup> define actinomycosis as a chronic disease caused by *A. bovis* or several species of the genus *Nocardia*. They mention that actinomycosis caused by certain strains of aerobic actinomycetes, now called *Nocardia*, present a clinical picture indistinguishable from the disease caused by *A. bovis*.

Since 1900, several workers<sup>7-33, 36, 37</sup> have reported canine cases which were called actinomycosis, streptothricosis, or actinomycotic. Information was obtained on 37 cases. The diagnoses for 20 of them was based on pathological findings, and various fungi were isolated from 17 of the cases.

From the Communicable Disease Center, Public Health Service, Federal Security Agency, Kansas City, Kan.

Dr. Larsh is chairman, Department of Plant Sciences, University of Oklahoma, Norman, Okla.

Dr. Habermann is from the Pathology Laboratory, National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, Bethesda, Md.

This report describes 2 canine cases. One was a case of actinomycosis caused by *A. bovis*, and the second a case of actinomycosis based on pathological findings.

### CASE 1

The dog involved was a male Pointer, age 4 to 5 years, purchased at Springfield, Ohio, at 1 year of age. It was kept at Columbus, Ohio, for a short period, and had been in Kansas City, Mo., since July, 1949. The dog first became ill about November, 1950. The primary symptom at that time was diarrhea. Later, respiratory disturbances appeared and a veterinarian who was consulted made a diagnosis of bronchitis and pneumonia. Various antibiotics (penicillin, streptomycin, aureomycin, chloromycetin) and sulfamethazine were administered, but the dog's condition continued to grow worse.

An examination on March 17, 1951, revealed the following signs: The dog was thin, the abdomen was tense and enlarged. The eyes were congested but the sclera was not icteric. Breathing was difficult. The appetite was normal. There were no sounds in the left chest on auscultation. A differential white cell count on blood obtained March 17 showed 5 per cent lymphocytes, 4 per cent monocytes, 1 per cent eosinophils, and 90 per cent neutrophils (segmented, 54 per cent; nonsegmented, 26 per cent).

In the early stages the dog had a temperature of 106 F. and intermittent fever

continued until death, which occurred on the morning of March 21, 1951, following an illness of four to five months. An autopsy was performed the same evening.

The following pathological changes were observed:

The body was thin. Its approximate weight was 30 to 35 lb. The organs of the abdominal cavity, with the exception of the liver, appeared normal. About ten or more lead shot were found scattered throughout the viscera, along the external wall of the intestines, and in the fat around the kidneys.

The organs of the thoracic cavity, with the exception of the heart, were almost beyond recognition. The entire cavity was black in color with white granular material scattered throughout. The cavity was filled with about 500 cc. of a clear brownish black fluid.

The lungs were collapsed and consolidated, with very little normal lung tissue left. The surface was black, rough and somewhat nodular, with white granular material dispersed throughout. The tissue cut with some resistance and was solid throughout. The pleura was rough and nodular in appearance and greatly thickened.

The heart appeared to be normal although the parietal surface of the pericardium was black, rough and nodular, similar to the pleura.

The spleen was pale pink and not enlarged. At the central portion of the parietal surface, areas of scar tissue were observed. These could have been caused by penetration of lead shot.

The liver was enlarged to approximately twice its normal size. It was reddish brown, except for a few areas that were yellowish.

Microscopically, the lungs showed in several sections the following pathology: There were cavities of irregular shape which were lined with epithelium. The content of the cavities was pus, represented in the major part by polymorphonuclear leukocytes. In a few areas in the pus there were small granules composed of gram-positive, long, rodlike structures which, in part, had the typical kidney-like shape of actinomycotic granules and stained metachromatic, with an acidophilic mycelium and gram-positive isolated filaments. There was also considerable atelectasis and a few scattered foci of bronchopneumonia. In a

few solitary spots, there was fibrosis of the lung tissues.\*

The pleura showed an organizing pleurisy with an infiltration of lymphocytes and plasma cells covered with a mantle of large mononuclear cells with some foreign body giant cell formation, and a fibrinopurulent exudate.

The liver showed infiltration of plasma cells and lymphocytes in the central and portal areas, and scattered areas of macrophages laden with black pigment in the portal areas and in the sinuses.

The spleen showed thickening of the capsule and trabeculae, distention of the cortical and medullary sinusoids with phagocytes containing a yellowish brown pigment.

The heart showed an infiltration of polymorphonuclear leukocytes in the interstitial tissue of the myocardium.

The kidneys showed degeneration of a few glomeruli and small areas showing an infiltration of lymphocytes, and in some cases in the proximal tubules there was some sloughing of the epithelium and small deposits of black pigment.

The pathology observed in the lungs was consistent with a diagnosis of actinomycosis. There is no specific tissue reaction to make a diagnosis of actinomycosis, but there is a chronic granulatory tissue as a rule with considerable fat storage and abscess formation. All these reactions were observed in the lung tissues of the dog.\*

**Laboratory Findings.** — At the time of the autopsy a portion of lung tissue was removed, ground in a sterile mortar, and sterile physiological saline solution added. This material was inoculated into deep agar shake cultures containing 1 per cent glucose in veal infusion agar with a pH of 7.4. The cultures were held in an incubator at 37 C. Growth appeared in two days as small cottony balls below the surface of the mediums. The organism was found to be a fungus with the following characteristics:

Gram-positive, nonacid-fast, distinct granules, mycelium fragmented, size—less than 1  $\mu$ ; gelatin—no liquefaction; serum—no proteolytic action; glucose and sucrose—acid, no gas; salicin, mannitol, and lactose—no acid, no gas; sodium thioglycollate broth—excellent growth; infusion glucose agar—excellent growth below the surface; litmus milk—acid in eight days; no hemolysis on blood; anaerobic; and best growth at 37 C.

The organism was thus identified as *A. bovis*.

\*Appreciation for permission to report his findings is expressed to Dr. Jan Schwartz, Jewish Hospital, Cincinnati, Ohio.

In addition, a small gram-negative rod was isolated from the lung tissue. It was identified as a *Klebsiella* sp.

Smears were made of the white granular material in the thoracic cavity and these were stained with Gram's stain. Gram-positive filaments, rods, and diplococci, and gram-negative rods with gram-positive granules were observed. An acid-fast stain showed these organisms to be nonacid-fast.

#### CASE 2

A Doberman, unsexed bitch, 2½ years old, was presented to the La Fond Veterinary Hospital, Detroit, Mich., on June 23, 1951, showing a distended abdomen.\* The owner stated that the condition was of sudden onset and that the dog had been normal until three days prior to hospitalization. There was no history of recent injury.

The dog was born in a large Doberman kennel in Detroit and was kept on a farm outside of the city. The farmer's son is an "organic" farmer and uses all waste material to fertilize his garden. The dog had access to this land and to the adjacent property. She was a hunter and caught birds and small animals.

The animal had a normal temperature and was active for four days in the hospital, then her temperature started to rise and she vomited several times. She died the following morning on June 28.

Paracentesis had been attempted June 25 in the area of the umbilicus, but no fluid was obtained. An analysis of a blood sample on June 24, had shown a count of 19,650 white blood cells, 5,300,000 red blood cells, and 11 Gm. of hemoglobin. A differential white blood cell count had shown 91 per cent neutrophils (4% myeloblasts, 1% juvenile cells, 25% stab cells, and 61% segmented), 5 per cent lymphocytes, and 4 per cent smudge. Urinalysis on June 24 had shown no abnormalities. X-rays on June 23 revealed only a generalized foginess suggesting an increased density within the abdominal cavity. A tentative diagnosis of ascites of unknown origin had been made.

Postmortem examination showed approximately 7 qt. of serohemorrhagic fluid with a large amount of flocculent precipitate in the abdomen. The peritoneum was thickened, inflamed, and roughened with fibrin deposits. The omentum was inflamed, ede-

matous, and contained two tumorous masses. One was an elliptical mass 15 by 5 cm. The other mass was spherical, 2½ cm. in diameter. The omentum was firmly attached to the abdominal wall at the umbilicus. The intestines showed ecchymotic hemorrhages along the entire length of the serosa. The spleen showed subcapsular hemorrhages, the heart was enlarged, and the other organs showed no significant lesions. The condition was diagnosed as ascites due to peritonitis.

Grossly, the tumorous masses of the omentum showed an encapsulated mass of firm grey to white tissue spotted with yellowish grey to orange-grey areas. On section, the tissue was pockmarked with yellowish grey areas. Microscopically, the tumorous tissue showed a partially encapsulated mass containing numerous large and small abscesses. These abscesses often contained granules in the center and were surrounded by numerous polymorphonuclear leukocytes, lymphocytes, and plasma cells (fig. 1). In adjacent areas were large mononuclear cells containing yellowish green pigment meshed in strands of fibrous connective tissue. The nearby adipose tissue showed infiltration of leukocytes, an occasional granule, and strands of fibrous connective tissue. A Gram's stain of the granules showed branching, intertwined gram-positive filaments, 0.2 to 0.3  $\mu$  in diameter. The diagnosis was actinomycosis of the omentum.

#### DISCUSSION

It is interesting to note that actinomycosis, a disease which has a world-wide distribution, and is quite common among cattle, appears to be reported rarely in dogs. Actinomycosis is not uncommon in man and it occurs in a variety of animals, both wild and domesticated. The disease is known to occur in deer and moose, sometimes in epizootic form.<sup>34</sup>

The epizootiology of actinomycosis is in many respects not clearly defined. At present, it is generally accepted that *A. bovis* is a true parasite of mucous membranes, never found in nature apart from a parasitic or pathogenic habitat. In man, *A. bovis* has been shown to occur in tooth cavities, on the surface of teeth, and in the crypts of tonsils. In such cases, there is no infection and the fungus grows without exciting any host reaction.

There is no evidence concerning trans-

\*Appreciation for permission to report this case is expressed to Dr. Charles P. Hodder, La Fond Veterinary Hospital, Detroit, Mich.

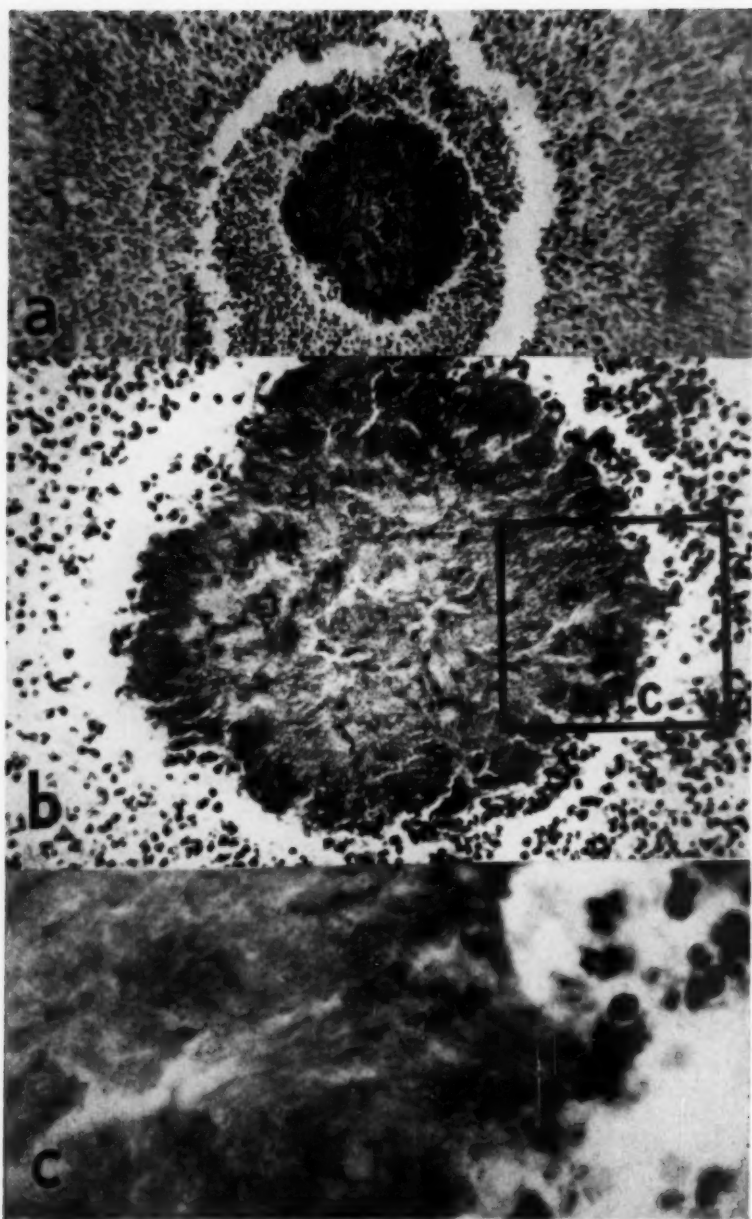


Fig. 1—Omentum of the dog (case 2) with actinomycosis, showing a granule surrounded by an infiltration of polymorphonuclear leukocytes, lymphocytes, and plasma cells.  
a— $\times 150$ ; b— $\times 425$ ; c— $\times 1666$ .



mission of actinomycosis among dogs. The first case described in this paper was a city dog and it had no known contact with infected dogs or cattle. The dog was used for hunting occasionally, and it evidently had been shot some time prior to the illness. The second dog was also a hunter, but there was no history of recent injury. It is interesting to note that most of the reported cases described as actinomycotic occurred among field dogs or the hunting breeds.

# SUMMARY

A case of actinomycosis in a dog is described. The clinical symptoms, autopsy report, and laboratory findings are shown. *Actinomyces bovis* was isolated from the lung tissue of the dog. A second case is described in which granules containing branching, intertwined, gram-positive filaments were observed in tumorous masses of the omentum.

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### Encephalitis in a Deer Due to *Actinomyces Bovis*

J. F. RYFF, D.V.M.

Laramie, Wyoming

Because of the interest in the possibility of rabies, when a deer showing nervous symptoms was reported, the game warden and a veterinarian submitted the head for examination.

The 3-year-old mule deer had been shot through the head, so that hemorrhages in the brain and nasal sinuses were undoubtedly due to this. In addition, a purulent

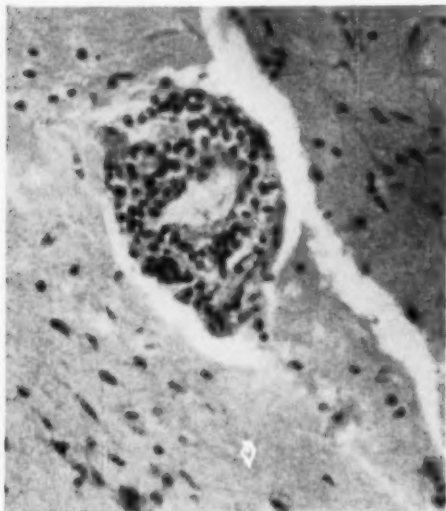


Fig. 1—Brain of deer showing perivascular cuffing. About  $\times 100$ .

nasal discharge was observed. Imprints from the region of Ammon's horn and the cerebellum did not disclose Negri bodies, so rabbits were inoculated intracerebrally and intralingually. The latter rabbit was destroyed after six months without having shown signs suggestive of rabies nor could Negri bodies be demonstrated. The intra-

From the Wyoming State Veterinary Laboratory, Laramie.

cerebrally inoculated rabbit was observed to have a drooping head two days before it died, some 13 weeks after inoculation.

Microscopically, the deer brain showed hemorrhages in most of the sections examined, but no importance could be attached to this because of the manner in which the animal had been destroyed. Half the total number of sections presented neuronophagia and several sections had perivascular cuffing. This consisted of a single layer of mononuclear cells about the vessel or more extensive, but sometimes irregular, layers (fig.1). Several small vessels were crowded with leukocytes, and several foci of mononuclear cells apart from blood vessels were seen.

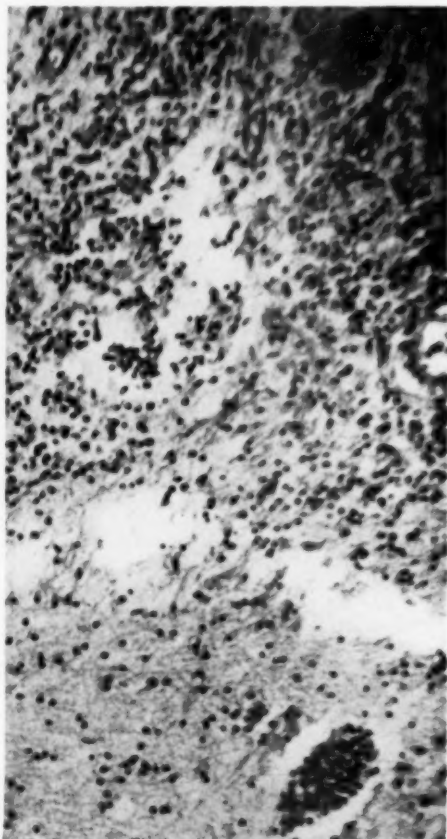


Fig. 2—Brain of rabbit showing marked cellular infiltration of meninges and involvement of small vessel. About  $\times 100$ .



A swab taken from the nasal sinuses in the region of the turbinate bones recovered hemolytic streptococci and *Pasteurella hemolytica*. The brain itself was sterile when cultured aerobically on blood agar. Subsequently, after a period of freezing (Gray, Stafseth, and Thorpe),<sup>1</sup> no *Listeria* organisms could be recovered nor could *Actinomyces bovis* be recovered by anaerobic means.

Examination of the rabbit which had received 0.03 cc. of inoculate intracerebrally, with aseptic precautions and under anesthesia, revealed 1 or 2 cc. of clear fluid underlying the meninges. An abscess  $\frac{1}{2}$  in. in diameter in the anterior part of the left cerebral lobe (the inoculation site) crossed the midline slightly to involve the

right side. Microscopically, lymphocytic infiltration of the meninges and submeningeal areas was observed, especially about the blood vessels (fig. 2). Adjacent to a large circular, necrotic focus, heavily cuffed vessels existed (fig. 3). Near here was a smaller, necrotic focus and large, rather diffuse infiltrations of lymphocytes, although perivascular cuffing was not confined to the local area. Another level of the necrotic focus contained an abundance of lymphocytes and at points in the periphery a lymphocytic, fibroblast-like demarcation could be distinguished.

A stained preparation of the pus from the rabbit abscess disclosed numerous pleomorphic gram-positive rods: short ones like diphtheroids and long ones varying in thickness, slightly curved, sometimes 2 or 3 in a chain, and occa-

Fig. 3—Brain of rabbit showing marked perivascular cuffing related to necrotic focus in upper right hand corner. About  $\times 100$ .



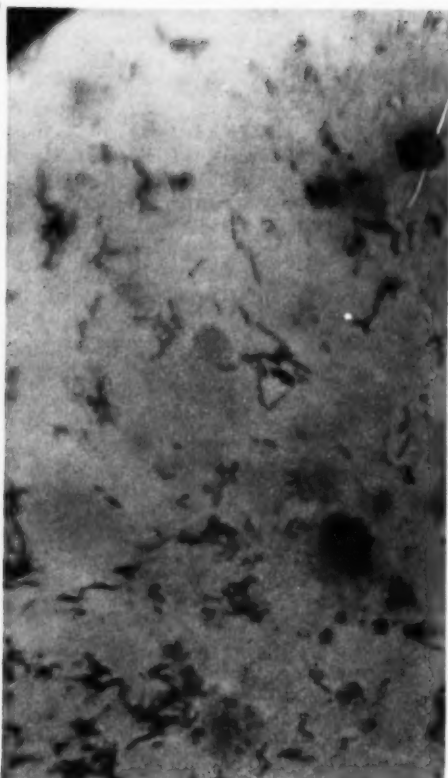


Fig. 4—*Actinomyces bovis* smear from the rabbit brain abscess. About  $\times 900$ .

sionally branched, as well as coccus forms (fig. 4). A few rods were gram-negative with gram-positive bars. After three days, anaerobic incubation on blood agar plates, hemolytic, convex, whitish, translucent colonies developed; at this time, they appeared as gram-positive, very pleomorphic rods of diphtheroid type. The culture formed a soft curd in litmus milk which in about two weeks became acid. Gelatin was liquefied, nitrate was not reduced, and dextrose (4 days), lactose, and mannite (16 days) were fermented but not maltose or sucrose. In general, the culture closely resembled *Actinomyces bovis* from bovine sources (Kingman and Palen)<sup>2</sup> except that it grew readily.

A rabbit receiving a heavy inoculum of culture intraperitoneally, soon after it was isolated, failed to develop symptoms or lesions although held under observation six months before being killed. Another rabbit receiving 0.025 cc. of a heavy suspension of this *A. bovis* culture intracere-

brally showed changes in equilibrium after four days but remained alive for eighty-seven days. Microscopically, the brain of this rabbit presented a large abscess with pronounced perivascular cuffing adjacent to it, varying degrees of perivascular cuffing elsewhere, and areas of diffuse and meningeal mononuclear infiltration.

#### CONCLUSION

It may be concluded that the encephalitis observed in the deer was not due to rabies but probably was the result of infection due to *Actinomyces bovis*. A rabbit inoculated intracerebrally with ground brain developed a brain abscess and meningoencephalitis from which the organism was readily recovered.

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#### Actinomycosis in a Horse

A 4-year-old Thoroughbred horse was presented at the University of Queensland veterinary clinic with a hard, lobulated mass, 4 by 2 inches, in the intermandibular space. A year earlier an abscess had been opened in the area. A few months later this swelling appeared.

When excised, it proved to be a fibrosed lymph node containing an encapsulated abscess about 1 inch in diameter with dark, somewhat granular content. The node was edematous but no organisms could be seen on stained sections.

Organisms cultured from the lesion appeared to be closely allied to *Actinomyces bovis*, except that they would grow under aerobic conditions.

Several cases of actinomycosis of the lungs in cattle and swine were found at a slaughter house (*Jap. J. Vet. Sci.*, 13, 1951). The lesions 0.5 to 7 cm. in diameter were found beneath the pleura of the lungs.—*Vet. Bull.*, July, 1952.

We see many cases of typhoid in chickens and turkeys but seldom any fowl cholera.—*C. L. Nelson, D.V.M., Iowa.*

## Nocardiosis in the Dog

### A Case Report

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THIS REPORT deals with the clinical, bacteriological, and pathological findings on a dog found to be spontaneously infected with *Nocardia asteroides*. A brief discussion of this subject also seems warranted, since no other report could be found in American literature regarding the isolation and identification of this organism from the dog.

#### CLINICAL FINDINGS

A small, female, Terrier-type dog, 9 months old, was submitted to the Veterinary Clinic at The Ohio State University on Dec. 11, 1951. The owner reported that the dog had been sick for about four days, exhibiting evidence of pain over the entire body, a loose stool which contained blood, and a large swelling on the right side of the neck. The dog's appetite had been fairly good. Upon physical examination, the dog seemed rather depressed, showed marked hyperemia of the conjunctiva, a dry encrustation of the nostrils, nystagmus, chorea of the right rear limb, a temperature of 102.4 F., and a warm, firm swelling on the right ventrolateral aspect of the cervical region, which was 9 cm. in length and 7 cm. in width. The dog was placed in an isolation ward and was given homologous canine distemper antiserum, hepatitis antiserum, and 500 mg. of aureomycin orally. The nose and eyes were treated symptomatically. The animal was skin-tested for histoplasmosis.

On December 12, the rectal temperature was 103.7 F. The animal was extremely depressed, refused to eat, and was salivating profusely. The swelling on the neck had not increased appreciably in size. In an attempt to pass a stomach tube to feed the dog, an obstruction was encountered. While the oral cavity and pharynx were being examined, the swelling on the neck ruptured. The area of the swelling was clipped and

cleaned and a blunt bistoury was used to enlarge the opening to allow better drainage. The discharge consisted of a blood-tinged, thick purulent exudate, a portion of which was aseptically collected. After drainage of the abscess, the stomach tube was easily passed and the animal was fed in this manner. The local treatment of the eyes and nose was continued and 250 mg. of aureomycin were administered orally.

On December 13, the rectal temperature was 102.4 F., with no improvement in the animal's condition. Bacteriological examination of the exudate revealed an organism thought to belong to the genus *Nocardia*. In view of the above findings, a radiograph was made of the thorax which revealed multiple radio-opaque areas in the lungs. A diagnosis of systemic nocardiosis was made. The histoplasmin skin test was positive. The owner was notified of the dog's serious condition and he agreed to humane euthanasia which was conducted December 14.

#### PATHOLOGICAL FINDINGS

The carcass was extremely emaciated with a sublaryngeal swelling located on the right ventrolateral aspect of the cervical region. A skin ulceration 3 cm. in diameter was located on the ventral part of this 9 cm. by 7 cm. swelling. The mass was firm in consistency except for a centrally located, soft, fluctuating area. Pressure upon the area caused oozing of reddish gray exudate containing small, yellow, semisolid masses. This large lesion extended from the laryngeal region subcutaneously to the base of the right ear. It was attached to the skin and communicated to the surface through the large ulcer. Following incision of the skin, the lesion was found to extend into the perilaryngeal and tracheal tissue as well as into the parotid salivary gland. This extensive suppurative lesion involved the skin, subcutum, cervical muscles, surface of the larynx and trachea, anterior cervical lymph nodes, the submaxillary and parotid

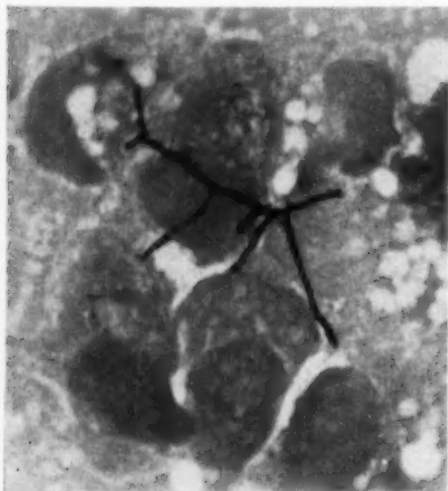
From the Departments of Bacteriology, Veterinary Pathology, and Veterinary Preventive Medicine, The Ohio State University, Columbus.



—Ohio State University

Fig. 1—Abscess and granuloma from the right ventrolateral cervical region showing the enlargement and ulceration to the surface.

salivary gland on the affected side. No evidence of encapsulation of the lesion was found. On cut section, this diffuse lesion revealed multilocular abscesses draining



—Ohio State University

Fig. 2—Gram stain of a smear prepared from the purulent exudate of the neck abscess.

into the central cavity which had ulcerated to the surface (fig. 1).

A small, fluctuating mass 2.5 cm. in diameter was found subcutaneously on the right thoracic wall lateral to the xyphoid cartilage. Incision of this mass revealed reddish gray, thick fluid exudate surrounded by a fibrous capsule. Upon exposure of the thoracic and abdominal viscera, the serous membranes were smooth and glistening except for the peritoneal surface of the diaphragm. This hyperemic area of the diaphragm was covered with numerous raised, gray nodules 1 to 3 mm. in diameter. Gray nodules 2 to 4 mm. in diameter were distributed over all lobes of the lungs. The visceral pleura was smooth and glistening but elevated by the firm superficial nodes.

On cut section, the lung presented gray, opaque nodules throughout the parenchyma. Petechial and ecchymotic hemorrhages were particularly prominent in the right diaphragmatic lobe. A mass measuring 4.5 cm. in diameter surrounded and included the bronchial lymph nodes and bronchi at the bifurcation of the trachea. The mass was soft in consistency and on cut section revealed diffuse inflammation with oozing of reddish gray exudate. The trachea contained a red-stained mucoid exudate. Three soft, gray, nonencapsulated lesions were observed in the myocardium. One lesion was located at the apex of the right ventricle, another in the interventricular septum, and the third in the wall of the left auricle.

Other than a superficial duodenitis, no lesions were seen in the digestive tract. The only liver lesions were grayish mottling of the surface, and swelling. The pancreas contained scattered small nodules similar to those observed in the lungs. Irregular gray areas, approximately 1 to 2 mm. in diameter, studded the surface of the kidney and, on cut section, extended deeply through the renal cortex. The endocrine glands, central nervous system, and other organs revealed no gross lesions. Representative specimens of lung, liver, and kidney were collected for bacteriological and mycological examinations. Tissues were fixed in 10 per cent formal saline solution, embedded in paraffin, and stained with Harris' hematoxylin and eosin, Gram's and Ziehl-Neelsen's stain for histopathological study.

Gram's stained smears of exudate and

scrapings from a cut section of the cervical lesion and bronchial lymph nodes revealed reticuloendothelial cells, epithelioid cells, neutrophils, monocytes, erythrocytes, and a few lymphocytes among the cellular debris, and numerous gram-positive, filamentous organisms. Tissue sections revealed reticuloendothelial cells and monocytes containing numerous intracellular *Nocardia*, stained blue with hematoxylin and Gram's stains. These organisms were oval or elongated in shape.

Extracellular *Nocardia* were seen as interlacing, beaded, irregular branching hyphae similar in morphology but somewhat smaller than those observed in smears. Hyphae were numerous in areas of liquefaction necrosis but less apparent in the surrounding inflammatory tissue. Blue irregular masses seen under high dry magnification in hematoxylin- and eosin-stained sections proved to be colonies of intertwining organisms when examined with the oil immersion objective.

Sections of the left parotid salivary gland showed extensive suppurative parotitis, granulomatous inflammation, and necrosis. Many intercalated ducts were distended with acidophilic homogeneous material indicating retention of secretion. Fibrosis of the gland tissue adjacent to the active suppuration indicated chronicity of the disease. This fact, along with evidence of extension of the parotitis to the subadjacent cervical lymph nodes and subcutaneous tissues, suggests that the left parotid salivary gland was the primary site of infection. Granulomatous and suppurative foci were seen in the heart, lungs, bronchial lymph nodes, pancreas, spleen, and kidneys. The presence of multiple small abscesses and granulomas in the heart, kidneys, and spleen indicates hematogenous dissemination of the *Nocardia*, probably from the primary lesion in the parotid salivary gland.

#### BACTERIOLOGICAL STUDIES

Microscopic examination of the purulent exudate taken from the newly opened cervical abscess revealed many gram-positive branching rods (fig. 2). These organisms measured 0.45 to 0.58  $\mu$  wide and 3.0 to 80.0  $\mu$  in length. One of the most striking characteristics was the deep blue staining, spherical- to bacillary-shaped masses separated by clear spaces in the filament, giving a beaded appearance (fig. 3). Inocu-

lation of a blood agar plate with this purulent material revealed, at the end of twenty-four hours at a temperature of 37 C., many pinpoint colonies, while a thioglycollate broth tube revealed no anaerobic growth. Stained smears from these colonies showed gram-positive branching rods. An acid-fast stain of the purulent material revealed that these organisms were not acid-fast when acid-alcohol was used as the decolorizing agent. No bacterial growth resulted from culturing the cerebrospinal fluid. Although this dog had been given a total of 750 mg. of aureomycin orally during the two days prior to autopsy, *Nocardia asteroides* was readily isolated in great numbers from the lungs, kidneys, and liver. Continued incubation of the blood agar plates and Sabouraud's medium failed to reveal *Histoplasma capsulatum*.

In an attempt to definitely identify this organism, which appeared to be an aerobic actinomycete and a member of the genus *Nocardia*, various observations were made on its biochemical activities, its morphology and colonial appearance, and its pathogenicity for laboratory animals. The organism failed to produce acid in the following sugars: glucose, sucrose, lactose, maltose, salicin, mannitol, arabinose, sorbitol, and rhamnose. Litmus milk was not changed. There was no liquefaction of gelatin or digestion of Loeffler's serum slant. Growth in broth was characterized by a pellicle formation with a few small floccules in the bottom of the tube.

As described by Ginsberg and Little,<sup>7</sup> there were some variations noticed in the colonial morphology. Especially upon primary isolation, the colonies were glabrous, wrinkled, orange in color, and very adherent to the medium. After several transfers there was a tendency for the colonies to appear chalky and white. By *in vitro* tests, using Difco antibiotic sensitivity discs, this organism was much more sensitive to streptomycin than to the other antibiotics tested—penicillin, aureomycin, bacitracin, chloromycetin,<sup>®</sup> and terramycin. This organism was not acid-fast when acid-alcohol was used as the decolorizing agent in the routine Ziehl-Neelsen staining method. However, when grown in litmus milk and when dilute sulfuric acid was used as the decolorizing agent, the organism did retain the carbol-fuchsin stain.

One milliliter of a saline suspension of the organism washed from the slope of an



agar slant, when injected intravenously into a rabbit, produced death in about eighty hours. Practically all of the internal tissues of the rabbit were studded with minute abscesses which were especially obvious in the kidneys, lungs, and spleen. Pure cultures of *Nocardia* resulted from the inoculation of blood agar plates with the rabbit tissues.

The characteristics of this organism would seem to justify its identification as *N. asteroides*. Cultures were sent to Dr. Morris A. Gordon, Communicable Disease Center, Atlanta, Ga., and to Dr. N. F. Conant, Duke University, Durham, N. Car., who also identified this organism as *N. asteroides*. The organism isolated by us appeared the same as those previously isolated from dogs by Ginsberg and Little<sup>7</sup> and Balozet and Pernot.<sup>2</sup>

#### DISCUSSION

Although the terms nocardiosis and actinomycosis often have been used somewhat synonymously to designate the same disease in dogs and man, the former term seems more appropriate when referring specifically to infection with the organisms belonging to the genus *Nocardia*. Nocardiosis has been described by Bernstein *et al.*<sup>2</sup> as an "acute or chronic infectious disease of granulomatous or suppurative nature, caused by an aerobic, gram-posi-

tive, inconstantly acid-fast species of the family Actinomycetaceae." McGaughey<sup>9</sup> states that since 1882 there have been recorded only 45 to 50 cases of actinomycosis in dogs. In only a few of these cases have the organisms been isolated and completely identified. Even when attempts have been made in this direction, there has been very little agreement as to the species involved. The explanation for these apparent discrepancies may lie in the fact that there are numerous types of pathogenic actinomycetes producing lesions of a similar or dissimilar nature, that there are recognized difficulties which may arise in the identification of these organisms, and that there has been some confusion in regard to their nomenclature as exemplified by the many synonyms for *Nocardia asteroides* (*Actinomyces asteroides*, *Cladothrix asteroides*, *Actinomyces gypsoides*, etc.).

Balozet and Pernot<sup>2</sup> in 1936 claimed to have been the first to record the isolation and identification of *A. asteroides* from the dog. Ginsberg and Little<sup>7</sup> in 1948 reported extensive studies of an organism which they isolated from a seropurulent discharge from a throat sinus in a dog and which they identified as *A. asteroides*. The dog was treated with penicillin and made a "quick recovery." They considered this to be the second recorded case of an *A. asteroides* infection in a dog.

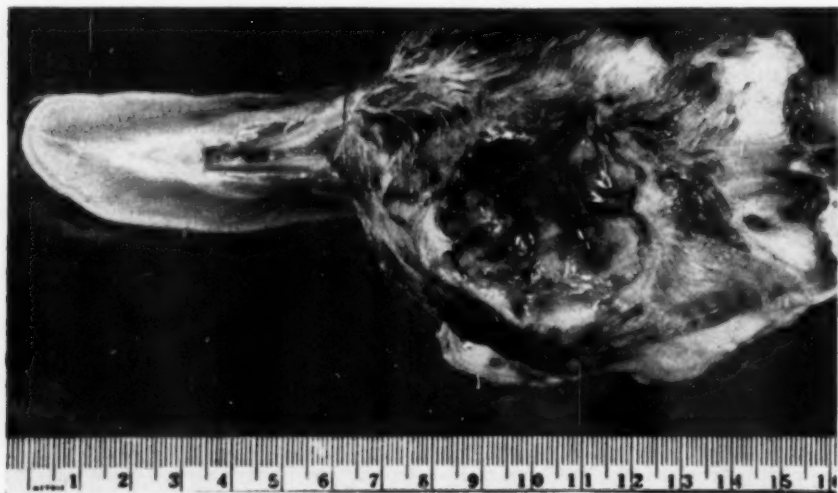


Fig. 3.—Gram stain of a lung smear showing details of branching and the beaded appearance.

—Ohio State University

Besides anaërobic actinomycetes,<sup>4,10</sup> there have been several other types of aërobic actinomycetes isolated from dogs. Goret and Joubert<sup>1</sup> recently described in detail a case of septicemic actinomycosis in a dog caused by a strict aërobic organism which they identified as a species of *Streptomyces*. The characteristics described for this organism have much in common with the organism which we have isolated. There have been other reported cases<sup>1,6</sup> of "actinomycosis" in dogs where the diagnosis was made by other than cultural methods and where the etiological agent could have been similar to the one herewith reported.

There have been 46 cases of nocardiosis in man recorded in the literature.<sup>3</sup> Few recoveries from this disease have been reported. The lungs have been involved in the great majority of cases, with draining abscesses in the neck or chest region often observed. Clinical signs are usually referable to the respiratory tract and may often simulate tuberculosis. Although *N. asteroides* has frequently been isolated from the soil, the mode of entrance of the organism into the body has not been established.<sup>11</sup> There have been no recorded cases indicating transmission of the disease from man to man or from animal to man.<sup>5</sup>

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#### Report on Polio Experiment

Gamma globulin injections given to 55,000 children in epidemic areas in the last eighteen months seem to have produced definite protection against the paralysis of poliomyelitis. The first trial was at Provo, Utah, in September, 1951. More extensive trials were made at Houston, Texas, and at Sioux City, Iowa, in 1952. The gamma globulin was prepared from blood collected from thousands of donors and its preparation was made possible by \$1,000,000 from the March of Dimes fund under the supervision of the national Red Cross. Half of the children in each area were injected as controls with a gelatin preparation.

During the first week after the injection, the number of new cases of polio was about the same in each group. However, within thirty days, half of the gamma globulin group had recovered whereas none of the controls had. In the second week, there were 3 new cases in the GG group as against 23 in the controls. In the following three weeks there were only 6 cases against 38 in the control. After the fifth week the passive protection had largely disappeared. An important factor, yet to be determined, is whether GG permits a mild infection which would develop an active long-lasting protection. This actually occurs in animals in the research laboratory.—*Nat. Foundation News*, Nov., 1952.

#### Parasitic Bronchitis in Cattle

"Husk" is the name applied to this condition in England, and two distinct clinical forms are recognized: One is the familiar disease of young animals characterized by a husky cough, the other is reported in older (even adult) animals and involves "exaggerated clinical symptoms suggesting the existence of an allergy." These consist of accelerated respiration, mouth breathing, and heaving flanks. Auscultation reveals crepitating sounds typical of emphysema, while percussion discloses areas of increased resonance. Coughing is a minor symptom, or is absent, while examination for the ova of *Dictyocaulus viviparus* is not a dependable basis for diagnosis. Sometimes autopsy is the only conclusive manner for clinching a diagnosis.—*Vet. Rec.*, Oct. 4, 1952.—R. C. K.



# SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

## The Conjunctival Flap Operation in Small Animals

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THE CONJUNCTIVAL flap operation is a simple surgical procedure that is readily learned. Useful vision may be recovered by this operation which requires little or nothing new in instruments or equipment. The experience of the writer indicates that equally good results may be expected in the dog or cat. The beneficial effect of the operation depends upon reinforcing a cornea, which may be weakened by disease or trauma, by bringing the conjunctiva over the defect. Mechanical support and a new blood supply from the conjunctiva accelerate the healing process.

threaten the eye. However, deep erosions of the substantia propria may weaken the corneal wall with danger of perforation and loss of eye contents.

*Traumatic Injury of the Cornea.*—*Superficial Injury.*—Injury to the epithelium or superficial parts of the substantia propria usually responds readily to medical treatment. When the extent of injury is in doubt, staining the cornea with fluorescein clearly delineates the wound. Many scratches and abrasions which might otherwise go undetected can be demonstrated with this agent.

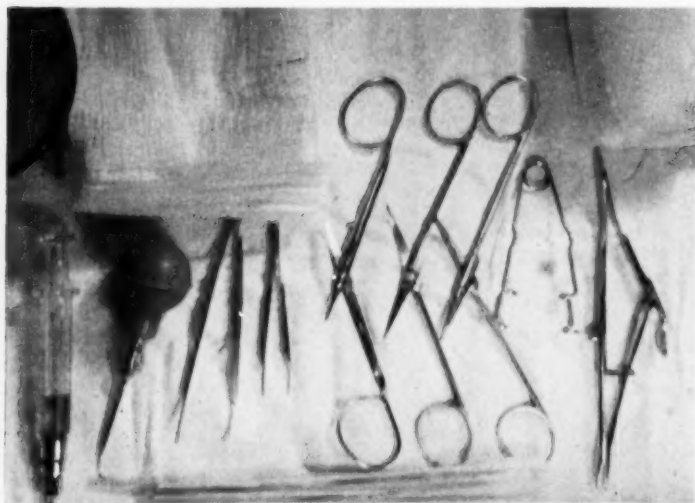


Fig. 1—Instruments for conjunctival flap.

### INDICATIONS

The operation is useful only when the deeper layers of the cornea are involved. The epithelium heals readily, and superficial loss of substantia propria does not seriously

*Deep Injury.*—Deep wounds which do not entirely penetrate the layers of the cornea will benefit from the operation. When expulsive efforts and self mutilation may produce perforation, it is better to operate than to risk loss of the eye.

*Perforating Injury.*—Uncomplicated per-

Dr. Roberts is a practitioner in Richmond, Calif.

forations of the cornea are rare. When perforation occurs, aqueous is immediately lost and it can be expected that other eye contents may be expelled with aqueous. If



Fig. 2—In this case, the conjunctival flap has been sutured.

there is no such loss, a flap operation will effectively prevent this calamity.

Small perforations are usually complicated by loss of other eye contents with the aqueous and it is not unusual for the iris to



Fig. 3—Descemetocoele in a cat, resulting from inept removal of a foreign body from the eye. The blister-like appearance of Descemet's membrane is somewhat unusual in this case.

adhere to the site of perforation, forming an adherent leukoma. The conjunctival flap operation effectively prevents further loss of eye contents and hastens repair. The iris needs no special attention and, while an irregular pupil results, the prognosis for vision is good unless infection supervenes.



Fig. 4—Descemetocoele showing sutures drawn up.



Fig. 5—Descemetocoele—the sutures have been removed and the conjunctiva is returning to its normal position.

Larger perforating wounds are usually accompanied by iris prolapse, and the iris and cornea may bulge forward to form an anterior staphyloma. When the prolapse is fresh, the iris is gently lifted 2 mm. out of



Fig. 6—Descemetocoele in a cat three months after operation. The cornea is smooth and while there is a dense central scar, there is some vision above. Considerable clearing of the central scar followed in the next two years and at present there is fairly good vision in this eye.

the wound and abscised at the level of the cornea. The previously prepared flap is then drawn over the defect and the sutures are tied. Older staphylomas are not benefited by iridectomy and they tend to become more ectatic with the passage of time. However, the cosmetic effect may be improved by use of the conjunctival flap operation which flattens the mass and reinforces the debilitated wall with conjunctival tissue.

**Ulcer of the Cornea.**—Ulcers which do not respond to medical treatment may perforate through the ulcer floor, with attendant loss of eye contents. This is especially true of hypopyon ulcer. Incarceration of iris and prolapse of lens or vitreous are not unexpected in such cases. Surgical intervention by flap operation before ulcers perforate may avoid eventual enucleation.

**Note:** Most corneal ulcers heal without surgery. The operation should be reserved for cases of threatened perforation. Here again, the use of fluorescein may help to determine the depth of penetration and the rate of ulcer healing.

**Descemetocoele.**—When a laceration or ulcer penetrates the substantia propria and reaches the level of Descemet's membrane, the pressure of aqueous fluid causes this elastic membrane to bulge forward, forming a localized ectasia. Such descemetocoeles are in imminent danger of perforation and should be operated upon promptly. Every case of descemetocoele will benefit from the operation. When it is withheld, perforation with loss of the eye is the rule. At best, a large anterior staphyloma develops which is subject to inflammatory and degenerative changes.

#### ALTERNATIVES TO THE FLAP OPERATION

**Spontaneous Perforation of Corneal Ulcers.**—Some benefits accrue to the eye when an ulcer is allowed to perforate spontaneously. Pain is immediately relieved, intraocular pressure is lessened, and the anterior chamber fills with a new medium rich in healing qualities. One must, however, consider the possible complications arising from perforation. If the ulcer is small and central, perforation may injure the face of the lens producing an anterior capsular cataract. If large, the lens may be dislocated or extruded and these eyes are better enucleated. Small peripheral perforations result in adherent leukomas, larger ones in iris prolapse. The sudden drop in intra-

ocular pressure may cause hemorrhage which may necessitate enucleation. Infection of the interior of the globe may result from a perforation of any size and the prognosis is then poor at best.

*Paracentesis of the Globe in Corneal Ulcers.*—Paracentesis has few of the disadvantages of spontaneous perforation and most of its advantages. This procedure can be done at the limbus or through the floor of the ulcer. The opening must, however, remain patent for several days requiring repeated handling and anesthesia.

*Tarsorrhaphy in Laceration and Ulcer of the Cornea.*—Suturing of the lids has been a popular procedure in the past. It is not indicated in treating most perforating wounds or ulcers of the cornea since it causes the part to be bathed in conjunctival discharge which is neither sterile nor beneficial. Tarsorrhaphy should be reserved for conditions in which the cornea is not properly protected, such as dryness of the cornea, proptosis of the globe, paralysis of the orbicularis, unconscious states and the like. When tarsorrhaphy is deemed advisable, it is best to leave some space between the lids for irrigation and medication.

In the years 1946 through 1951, the conjunctival flap operation was performed on 24 dogs and 3 cats with uniformly satisfactory results. These cases included corneal ulcers, corneal lacerations, descemetoceles, and staphylomas.

#### THE OPERATION

*Instruments.*—The following instruments are needed for the operation: small, blunt-pointed scissors; iris forceps or other small toothed forceps; 000 medium chromic catgut with atraumatic needle; shrouding material and towel forceps; scalpel; cotton-tipped applicators and sponges; 2 or 4 oz. rubber bulb syringe.

*Preparation.*—An attempt is first made to remove the iris from the site of real or threatened perforation. Thus, in central perforation, a mydriatic is used; while in peripheral perforation, a short-acting myotic such as 1 per cent pilocarpine is preferred. In cases where atropine is ineffective in producing mydriasis, the writer has found 10 per cent ophthalmic neosynephrine to be effective. Intravenous pentobarbital sodium or pentothal sodium is preferred for producing surgical anesthesia.



Fig. 7—Descemetocoele in an aged Boston Terrier. Descemet's membrane may be seen to bulge forward at the superior part of the cornea. Left untreated, such an ectasia rapidly organizes to form a staphyloma which is disfiguring and subject to inflammatory and degenerative changes.

The lashes are trimmed with scissors, and the periorbital hair is then clipped with a No. 40 Oster clipping blade. A bulb syringe is used to irrigate the conjunctival sac with sterile normal saline solution. The lids and periorbital skin are washed with soap



Fig. 8—Descemetocoele in an aged Boston Terrier three months after operation. A pseudopterygium appears in the region of the descemetocoele. The operation has effectively prevented perforation with little harmful scarring.

and water, followed by aqueous zephiran solution, and then painted with metaphen. The area is draped to allow access to the eye and adnexa. Aseptic techniques should be observed throughout the operation and the writer prefers to wear gloves.



Fig. 9.—Postoperative appearance. A band of conjunctiva covers the defect preventing further loss of eye contents. This is a pseudopterygium.

#### TECHNIQUE

To permit good control of the globe during surgery, it is well to insert sutures in some of the extraocular muscles. While they are not well developed in the dog or cat, the four recti muscles may be identified. A deep suture in the bellies of the inferior and superior recti at the outset will avoid much unnecessary pressure on the globe when the conjunctival flap is sutured. With the scalpel, an annular incision is made in the bulbar conjunctiva 2 mm. from, and parallel to, the limbus. The edge of the conjunctiva is then held with tissue forceps while it is undermined posteriorly with scissors. In a similar manner, the conjunctiva is freed from the underlying sclera at all indicated points around the limbus to a depth of 1.0 to 1.5 cm. A purse-string suture is then taken in the free edge of the conjunctiva.

It is sometimes necessary to discontinue the conjunctival undermining at the junction of the nictitating membrane and the edge of this membrane may then be sutured as part of the conjunctival flap. The conjunctival sac is again irrigated with sterile normal saline solution and the ap-

propriate mydriatic or myotic is instilled. The suture is then drawn up and tied.

In case of central perforation or ectasia, it is sometimes best to undermine only the superior and inferior portions of the bulbar conjunctiva and to bring the freed conjunctiva together over the defect with a mattress suture. This permits the best protection of the injured part. It is advisable not to place excessive tension on sutures to avoid them cutting out at the third or fourth postoperative day. If the flap can not be readily drawn over the injured part, additional undermining or corrective positioning of the flap is necessary. In any case, it is necessary for the conjunctiva to completely cover the corneal defect.

When the operation is completed, the freshly separated underside of the conjunctiva is in contact with the cornea while the bulbar conjunctiva appears in the palpebral fissure.

#### POSTOPERATIVE CARE

The conjunctival sac is irrigated three times daily with sterile normal saline solution and a small amount of penicillin is inserted each time. Parenteral penicillin is given every other postoperative day until the time of dismissal. The sutures have usually sloughed out by the eighth postoperative day, but if they have not, they are removed at that time.

As the conjunctival flap retracts, the cornea again appears in the palpebral fissure. Further treatment consists of the application of 1½ per cent cortisone acetate ophthalmic ointment inserted in the eye every eight hours.

In many cases, the conjunctiva will remain adherent at the point of corneal damage constituting a pseudopterygium. If it is central, pterygium may interfere with vision and should be removed surgically. If it is peripheral, pterygium is usually of little consequence and may be left intact.

#### CONCLUSION

The conjunctival flap operation is a simple and effective method of treating real or threatened perforation of the cornea.

Uncapped, abandoned artesian wells make excellent breeding grounds for cattle liver flukes.—*Sci. News Letter*.



## A Clinical Report on Anavenol (An Ascending Type of Equine Anesthetic)

L. A. DYKSTRA, D.V.M., and D. A. RICKARDS, M.R.C.V.S.

*Aurora, Illinois*

THIS IS a report of the use of anavenol® (B-naphthoxyethanol) which we have been privileged to work with for the past two years. We have found it both safe and reliable for equine anesthesia.

With the previous methods available for anesthesia in horses, utilizing chloral hydrate and/or barbiturates as principal sedative agents, the main disadvantage lay in their long duration and mode of action. The latter is generally described as being of a "descending" nature, *i.e.*, affecting the centers of consciousness prior to those of locomotion. This always presents a problem of restraint in the semiconscious animal. Even though magnesium sulfate, pentothal,® nembutal,® and others have been used as synergists for induction, it is common to observe a return of the power of locomotion before that of equilibrium during the recovery.

Anavenol is a thick, white, creamy liquid, stable at room temperature. It is injected with the patient standing, via the jugular vein, either by syringe or other form of pressure equipment, the viscosity of the product being too great to make a gravity apparatus satisfactory. It is said that perivascular injection is without consequence.

The induction dose, which varies from 80 to 250 cc. according to the weight of the horse, must be given relatively rapidly over a period of ninety to 120 seconds. Due to its rapid elimination via the kidneys, it seems that if the drug is administered at less than this speed, the animal reaches a stage where the rate of elimination equals that of injection and will remain in a rather light state of sedation. In some instances, we have observed a white secretion from the nostrils, during and immediately following its use, that looks somewhat like the product itself. This would lead us to believe that it might be eliminated in part via the mucous mem-

branes of the upper respiratory tract. This discharge, however, has shown itself to be of no significance and disappears within a few hours.



Fig. 1—There is great reluctance on the part of the patient to rise until he is able to stand and walk normally.

It appears that anavenol produces anesthesia of an "ascending" type, *i.e.*, affecting the motor centers of locomotion first and the centers of equilibrium and consciousness later. This characteristic causes the horse to stand after a partial dose as though rooted to the ground. As the effective dose is approached, the horse sinks to



Fig. 2—All of our patients were on their feet in five to ten minutes.

Drs. Dykstra and Rickards are general practitioners in Aurora, Ill.

®Supplied through the courtesy of Imperial Chemical (Pharmaceuticals) Ltd., Manchester, England, for investigational and experimental use.

the ground with very little movement of the head or legs and few or no hobbles are required. Usually, the patient is well enough anesthetized at this stage for surgery of short duration. However, it may be put into a deeper stage of anesthesia by additional administration of anavenol, using the usual reflexes to determine the degree attained. The duration may be prolonged by repeated injections of sufficient amounts to accomplish the desired state of control and relaxation. Due to its ascending nature, it requires a deeper anesthesia level for head surgery than elsewhere. This is a disadvantage.

All our patients were on their feet in five to ten minutes, showing great reluctance to rise until they were able to stand and walk normally, suggesting that sensation returns in a descending manner. There is not the incoordination and stumbling common to chloral hydrate and allied anesthetics.

We have observed several cases where anavenol has been used that, when the animal first went down, there was a tonic spasm of the legs, embarrassed respiration, and tachycardia, due possibly to a little too rapid administration. Within a matter of seconds, however, the animals relaxed and breathing became regular. In one instance, a case of molar repulsion, an attack of colic occurred immediately following the operation. Symptoms of abdominal distress suggested an intestinal impaction, which was disquieting not only to the patient and the owner but also to us. Recovery took place in about thirteen hours without further sequelae, so we are very much inclined to believe that this was entirely a coincidence. Nothing similar was observed in the other instances where anavenol was used.

Anavenol has been used extensively and efficaciously in Great Britain and France, and throughout Central and South America. We feel that this drug has proved very useful in producing the proper degree of anesthesia in horses, particularly for surgery of short duration, such as castration. We found no undesirable side actions preceding or following its administration. It is our understanding that an improvement has been made in anavenol and that the new product, known as anavenol-k is suitable for both equine and bovine anesthesia.

## Indications for Splenectomy

The functions of the spleen are not yet completely understood. In some persons it is congenitally absent, yet they live a normal life. Its removal apparently does not have detrimental consequences. Among a list of indications for splenectomy are traumatic conditions, torsion of the spleen, splenic tumors, congenital hemolytic anemia, congestive splenomegaly, and several others. However, splenectomy is contra-indicated in leukemia, Hodgkin's disease, cirrhosis of the liver, splenomegaly due to parasites, or acute infections and hypoplastic or aplastic anemia.—*J. of Student, A.M.A., June, 1952.*

*Gastric Carcinoma in Dogs.*—The Veterinary School of the University of Glasgow reports that in six years they have studied 66 carcinomata of dogs, only 2 of which originated in the gastric mucosa. In surveying veterinary literature, they found 9 other confirmed or probable cases. In contrast to this, in human cases from 20 to 40 per cent or more of carcinoma are recorded as originating as gastric cancers.—*J. Comp. Path. and Therap., Oct., 1952.*

## Hereditary Defects in Calves

During the past winter, a herd of milking Shorthorns in Canada produced 6 calves with tendon contracture and rigid, flexed limbs. All were carried to full term but were undersized. Embryotomies were necessary to deliver 3 while the other 3 were delivered intact, although in 1 case vaginal lacerations made the immediate marketing of the dam advisable. Five of the 6 were either dead at birth or died shortly after. The sixth was destroyed after it had demonstrated that respiration in such cases could be normal.

A study of the herd history revealed that 2 similar cases had occurred the year before and that it is an inherited defect which results from inbreeding. A study of the herd history revealed that sire A was the chief offender but that a second bull was involved. When bred to his daughters or granddaughters, the condition usually occurred at about the ratio which would be anticipated for a simple recessive type of inheritance.—*Canad. J. Comp. Med. Vet. Sci., Nov., 1952.*



### Santa Gertrudis Sales Record

A growing interest in the first American breed of cattle, the Santa Gertrudis from the King Ranch in Texas, was indicated at a recent sale. A record price of \$40,000 was paid for a yearling bull, \$31,000 for another. The 21 yearling bulls averaged \$8,583, \$81 per head higher than the average last year. The 44 purebred heifers averaged \$1,669.—*Western Livestock J.*, Dec. 11, 1952.

### No Goat-Sheep Hybrids

For ages people have been trying to separate the sheep from the goats but recently, at Texas A. & M. College, an attempt was made to cross sheep with goats. When female goats were bred to rams some became pregnant but the embryos died before birth. When the reverse process was tried nothing happened. The egg transfer method was next tried and was successful from ewe to ewe and from goat to goat but not when deposited in the different species.—*Farm J.*, Jan., 1953.

*Minerals and Infertility.*—Deficiency of a trace element caused infertility in a number of herds of dairy cattle. The condition was particularly aggravated by a high calcium intake, and it could be rectified either by providing the deficient trace element or by supplying an excess of phosphorus to counteract the excess of calcium present.—*Vet. Rec.*, Oct. 18, 1952.

### Delayed Umbilical Ligation

When the human infant is born, the umbilical cord should not be severed quickly since much of the infant's blood is in the placenta and, as the uterus contracts, this will be forced back into the body. Early clamping of the cord is therefore equivalent to severe hemorrhage. The blood volume of the infant is increased by 25 to 33 per cent by delayed clamping and the infant's weight increases correspondingly. Most of this blood transfer occurs within the first two or three minutes after birth. Furthermore, the increased number of red blood cells means a higher hemoglobin content. Even when 8 or 10 months old, an infant

whose cord was clamped early will still have lower corpuscular hemoglobin values than one whose cord was clamped later.—*J. Student, A.M.A., Dec., 1952.*

[This feature has received little if any attention in the veterinary field and probably would have little significance since nature usually takes care of severing the umbilical cord.—Ed.]

To facilitate removing a plaster cast, lay a piece of obstetrical wire lengthwise on the bandage before the cast is applied. Cut the cast with this wire saw when ready to remove it.—*Wm. Riley, D.V.M., Michigan State College, East Lansing.*

### Treatment of Chronic Pain

Just as diabetes or heart conditions can be accommodated by reasonable means, so can pain such as that which accompanies cancer. The agents available for this control are drugs, x-ray therapy, hormones, and surgery. Morphine should be reserved as the drug of last resort. Starting with aspirin, the sequence should be acetophenetidin, codeine, demerol, methodone, and finally morphine. Whereas aspirin raises the pain threshold by 35 per cent, morphine raises it 70 per cent. X-ray therapy usually will be applied before drugs are necessary. It provides an unquestioned relief of pain in bone metastases.

Hormone therapy is indicated only in cancer of a mammary gland or the prostate. Surgical measures should be withheld until all other measures have been tried. They aim to interrupt the pain sensation carried in the sensory pathways either with chemicals or by surgery. Ninety per cent alcohol can be used in some cases. Surgery is delicate and should include only the pain-bearing fibers. As a last resort in human patients a prefrontal lobotomy can be performed. While it gives remarkable relief to pain, it also transforms the individual to a superficial, lackadaisical personality which may shock his family and friends.—*Medical Times, Dec., 1952.*

When Moving, Please Advise the AVMA

# The Technique Employed in Splenectomy of Bovine Animals

D. W. GATES, V.M.D., M.S.

Beltsville, Maryland

THE PHYSIOLOGY of the spleen is not well understood but it is generally accepted that it is not indispensable to the functioning of normal organisms. Normal animals tolerate its removal without important changes or disturbances in function.

The operation, consisting of removal of the spleen, was first performed on man in order to correct certain conditions which were the result of accident or disease. Later, the same operation was performed on the lower animals in connection with research. In this way, it not only gave relief to people suffering from disease or accident involving the spleen but gave research workers an additional tool with which to work.

Apparently, the first excision of the spleen mentioned in medical literature dates back to 1549. The operation is stated to have been performed on a Greek woman by Zacarelli, a surgeon in Naples. The entire organ was removed, the wound closed by sutures, and recovery occurred in twenty-four days.<sup>1</sup> O'Brian, a naval surgeon, is credited with performing a total splenectomy in 1816. The patient was a Mexican, 39 years of age; the organ had been exposed for two days. Recovery occurred in forty-five days. Apparently, this was the first case of splenectomy reported in America.<sup>2</sup>

According to the records, experimental splenectomies were first performed in the seventeenth century. Apparently, the dog was the first animal to be used for this purpose. Zambecari made observations on splenectomized dogs in 1680.<sup>3</sup> Peterson, Morley, Griffin, and McNarmara, working with Warthin at the University of Michigan, splenectomized a number of sheep and goats. Warthin reports that many of the sheep went into shock following the operation and, as a result, 50 per cent of them died.<sup>4</sup>

DeKock and Quinlan of the Union of South Africa successfully performed the operation on horses, sheep, cattle, and goats in 1926.<sup>5</sup>

Splenectomies were first performed by workers in the U. S. Bureau of Animal Industry in connection with anaplasmosis investigation beginning in 1929 and are recorded in the 1931 report of the chief of the Bureau of Animal Industry.<sup>6</sup>

The splenectomies reported in this paper were

performed in order to obtain splenectomized calves for anaplasmosis antigen production for complement-fixation work and for diagnostic work at the Animal Disease Station, Beltsville, Md., during the ten-year period from 1943 to 1952. It is the purpose of this article to describe a practical method for splenectomizing cattle.

## MATERIAL AND METHODS

At the Animal Disease Station, a room approximately 12 by 12 ft. is used for this operation. It has a concrete floor with raised borders so it can be flooded for disinfecting purposes. The room is given a thorough cleaning several days prior to the operation, consisting of removing all debris, thoroughly cleaning with soap and water followed by spraying with a 2 per cent lye solution. The floor is flooded with the lye solution to a depth of 2 in. or more. The following day, the lye solution is drained off and the floor is hosed down with water, allowed to dry, and then is bedded down with clean straw.

The equipment necessary to do the operation includes electric clipper, straight razor, Bard-Parker scalpel, two long, curved forceps, several hemostats, large and small curved needles, linen and catgut suture material. An emasculator is always included, due to the fact that most of the animals are males and we make a practice of doing the castration just after the splenectomy. Rubber gloves (one with a long sleeve), ether, tincture of iodine, and therapogen complete the list of supplies. The instruments and gloves are sterilized by autoclaving for thirty minutes at 15-lb. pressure. The animals should be healthy and in good condition. As a rule, the animals are weighed and moved into the building where the operation is to be performed several days previous to the operation. All feed should be withheld twenty-four hours prior to the operation.

A general anesthetic is considered best for this work. A 40 per cent solution of chloral hydrate was used intravenously for all the splenectomies. The dose was carefully worked out and determined to be 0.15 cc. per pound of body weight. The successful use of this drug depends largely upon the rapidity with which it is given, the exactness of the dose, and its careful administration. Fatalities have occurred from giving the drug too fast. In order to insure that it be given slowly, a small syringe (10 cc. for calves, 20 cc. for mature cattle) is used. When a syringe of this size is used, it is necessary to disconnect and refill frequently. This is desirable from the standpoint of time consumed, but has the disadvantage of increasing the possibility of the needle

From the Pathological Division, Bureau of Animal Industry, Beltsville, Md.

coming out of the vein before the operation is completed. In order to reduce this possibility, a 3-in., 13-gauge needle is used.

The hair over both jugular veins and over the left flank is clipped. Both sides of the neck are scrubbed well with ether and painted with tincture of iodine so if a subcutaneous hemorrhage occurs, the operator can simply change to the other side without the delay of preparation. The needle is inserted deeply and the proper amount of the anesthetic is administered through the vein. The animal usually goes down before the entire amount is given but experience has proved that it is better to proceed with the entire dose. Although a little blood will be lost, it is advisable to allow the needle to remain in the vein until the incision in the abdominal wall is made. If complete anesthesia is in evidence at this time, the needle may be removed, otherwise additional anesthetic should be given.

tant as in adult animals, in which case it should be made close to the posterior border of the last rib. The further forward the incision in adult animals, the easier it is for the operator to reach the apex of the spleen. The incision should be made parallel to the last rib and of sufficient size to admit the arm.

The operator wears a long-sleeved rubber glove on the left hand and a regular glove on the right hand. The left hand is inserted into the incision and passed forward until the fingers reach the spleen. By forcing the hand between the spleen and rumen, the operator is able to break down the connective tissue which attaches the spleen to the rumen. The apex of the spleen is then grasped by the left hand and,

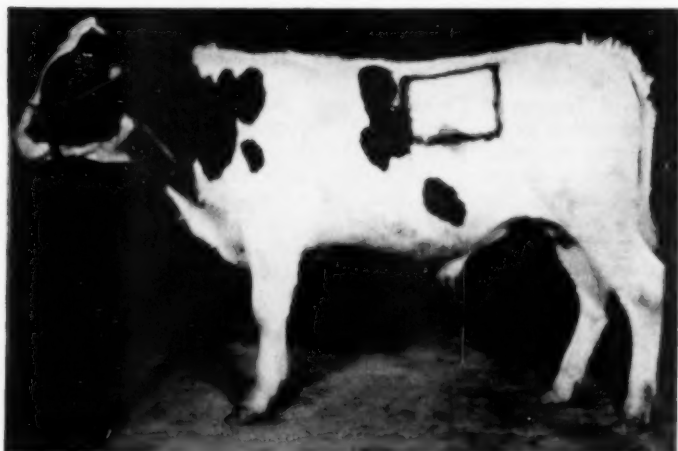


Fig. 1—Area to be prepared for splenectomy operation.

#### TECHNIQUE OF OPERATION

An area approximately 1 ft. square on the left flank is shaved and disinfected. The dorsal border of the area should be over the transverse processes of the lumbar vertebrae. The shaving is delayed until the animal is in a recumbent position since this position pushes the flank out, forming a convex surface, otherwise the shaving is much more difficult. Also, delaying the shaving until the animal is down gives additional time for the anesthetic to become effective.

An incision is made through the skin, muscles, and peritoneum, a few inches posterior to the last rib. In young calves, the location of the incision is not as impor-



Fig. 2—Incision completed through abdominal wall.

by using gentle traction and careful manipulation, the entire spleen is drawn through the incision with its blood vessels still in-

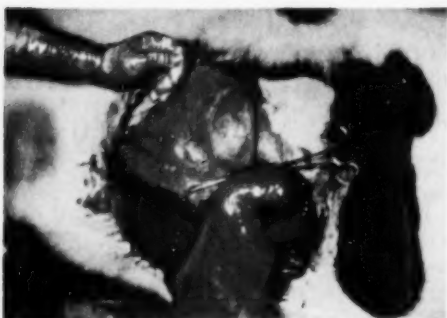


Fig. 3—Spleen outside abdominal cavity but still attached by vessels.

tact. A twist is put in the splenic vessels by turning the entire organ one revolution to the right. A large, curved forceps is placed over the vessels close to the surface of the spleen. The splenic artery and veins are tied off by placing a number of catgut sutures through tissues surrounding the vessels. Ligating the vessels in a twisted position insures that no hemorrhage will occur when they have been severed.

Another large, curved forceps is placed over the ligated vessels and the spleen is rotated to the right until the vessels are severed. Both pairs of forceps are held by the assistant during the twisting operation in order to assure that the vessels are



Fig. 4—Incision closed by sutures.

severed at the proper point. The forceps are then released and the incision closed with two deep, and three superficial, linen sutures. The two deep sutures go through the skin, muscle, and peritoneum. The three superficial sutures simply go through the skin, one between, one above, and one below the deep sutures. A thin piece of cotton about 6 in. long and 4 in. wide is placed over the incision. There is usually enough blood and serum on the surface of the wound to cause the cotton to adhere to it when it becomes dry.

Feed and water are withheld from the animal for twenty-four hours. It usually requires only a few hours for an animal

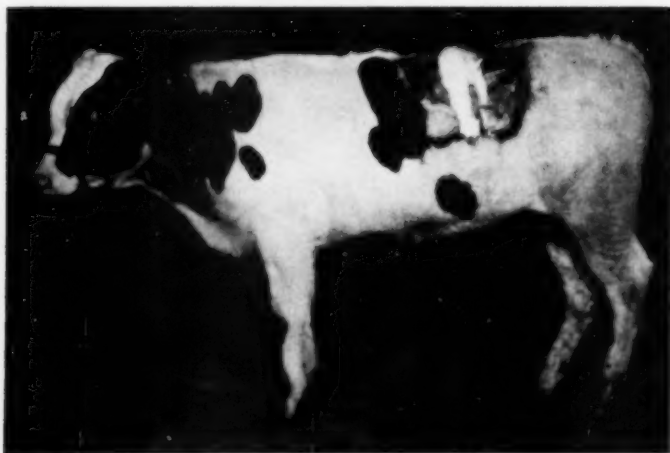


Fig. 5—Twenty-four hours after spleen was removed.

to recover sufficiently to get on its feet. Usually no treatment is required until the fifth day when the deep sutures are removed. At the end of ten days, the super-

TABLE I—Results of 205 Splenectomies During a Ten-Year Period

Year	Animals splenectomized	Animals died as a result of splenectomy
1943	2	.....
1944	40	.....
1945	22	.....
1946	17	.....
1947	8	1
1948	15	2
1949	20	.....
1950	31	1
1951	39	.....
1952	11	.....
10 years	205	4

1.9 per cent mortality

ficial sutures are also removed. Healing by first intention is the general rule. Occasionally, infection occurs where the sutures pass through the skin but this quickly disappears when the sutures are removed and sulfanilamide powder is applied. It requires three to six weeks for the wounds to heal completely.

#### RESULTS

A total of 205 animals ranging in weight from 150 to 1,200 lb. were splenectomized during a ten-year period. Four animals died as a result of the operation. Two of the 4 animals died from the anesthetic. The remaining 2 died from hemorrhage. The dose of 40 per cent chloral hydrate solution was originally determined to be 0.13 cc. per lb. of body weight. Further investigation proved that 0.15 cc. per lb. of body weight gave more satisfactory results.

#### DISCUSSION

It is generally accepted that calves have a degree of natural resistance to anaplasmosis infection. When splenectomized, they become highly susceptible to the infective agent. Splenectomized calves are used in anaplasmosis antigen production where a high degree of parasitization is desired. In addition, splenectomized calves are also used for subinoculation diagnostic tests. The splenectomy operation is also employed to detect the presence of infection in carrier animals by provoking a relapse.

It enables the worker to make considerable saving in the cost of animals for experimental purposes and, in addition, simplifies the handling operation.

Chloral hydrate was satisfactory as a general anesthetic for splenectomizing cattle. The method of injecting chloral hydrate with a small syringe makes it practically impossible to give the anesthetic too rapidly. The large needle insures that the solution goes into the blood stream and not into the surrounding tissues.

The control of hemorrhage by suturing the splenic artery in a twisted position insures that little, if any, hemorrhage occurs after the vessel has been severed.

The after-treatment is important, especially the withholding of feed and water for twenty-four hours. The prompt removal of sutures and a daily check during hot weather to prevent fly larvae infestation is also important.

#### SUMMARY

1) A total of 205 head of cattle were splenectomized over a ten-year period. Four animals died as a result of the operation: 2 from the anesthetic, 2 from hemorrhage. Ninety-five per cent of the splenectomies here reported were performed on calves. Five per cent were mature cattle.

2) Chloral hydrate gave satisfactory results as a general anesthetic for splenectomy operations when given intravenously at the rate of 0.15 cc. per lb. of body weight of a 40 per cent solution. It is important to use freshly prepared material, to calculate the dose exactly, to inject it slowly, and to be sure that all the solution goes into the vein and not into the surrounding tissues.

3) Cattle of all ages can be successfully splenectomized. However, it is best to splenectomize when they are calves, if possible.

4) Care should be exercised in selecting animals which are healthy and in good condition for the splenectomy operation.

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### Notes from U. S. Livestock Sanitary Association Meeting, Oct. 29-31, 1952

**Atrophic Rhinitis.**—The disease is reported to have been present in Europe for seventy years and to occur in enzootic cycles. When introduced into a herd few symptoms are noticed until late the first year but they often appear in the young pigs the second year. On autopsy many show a secondary pneumonia in the apex of the lungs.—R. S. Smiley, D.V.M., Columbus, Ohio.

In Canada atrophic rhinitis does not seem to have a pneumonia associated with it. The pneumonia could be a virus complication.

The tissue atrophy could be due to a localized deficiency since the lesions simulate those supposedly due to vitamin C deficiency in man. The first symptom is often a purulent exudate on the ethmoid turbinates.

This disease may be somewhat self-limiting since it has a tendency to disappear from a herd. This may indicate development of a natural immunity. However, baby pigs are most susceptible just when they should be getting antibodies from their dam's milk. Their resistance seems quite complete after three or four weeks.—T. Lloyd Jones, D.V.M., Guelph, Ont.

**Feed Bag Sanitizing.**—The efficacy of a feedbag sterilizing machine was tested and proved to be effective. Contaminants, composed of Newcastle disease and fowlpox virus, fowl typhoid, and erysipelas bacteria, one thermophilic organism, one spore-forming organism, plus coccidia oöcysts and ascarid eggs, were implanted in the sacks used for the tests. The virus and bacteria then were lyophilized and all tests were duplicated and checked with controls. The oöcysts and ascarid eggs did not sporulate or embryonate so they could not be destroyed in the process; therefore to that extent it was not considered satisfactory.

The machine was operated at pressures of 50 to 90 lb. and killed other infective agents except the spores. All control contaminants remained viable.—F. R. Beaudette, D.V.M., New Brunswick, N. J.

**Experiences with Hog Cholera Vaccines.**—The new modified vaccines were first publicized in 1946 but not released until September, 1951. They were in demand and widely used in Georgia in the fall of 1951 and the first few months of 1952. However, due to many over-reactions from vaccination and some apparent immunity failures there has now been a partial retreat to serum and virus. This has recently produced some cholera in hogs which were vaccine-treated in the spring and were exposed to serum and virus vaccinated fall pigs.

In the first five months of 1952, cholera was diagnosed in 32 herds vaccinated with new modified vaccines. This was only a fraction of the trouble cases involving the new vaccines. In 19 of the 32 herds, other factors might be held responsible for the breaks but in 13 herds conditions were such that there should have been no trouble. In five of the 13 herds, breaks came on the sixth to twelfth day, with 32.1 per cent of the pigs in the herds affected. The other eight breaks came twenty-one to 120 days after vaccination, with 29.1 per cent of the pigs affected. Vaccines used without serum were involved in 76.9 per cent of the herds.

Susceptible pigs were inoculated with spleen suspensions from some of the over-reaction pigs. None sickened but the inoculation apparently immunized them against cholera.

In a preliminary test of M. L. V. with serum, on susceptible pigs, only 1 of 6 pigs developed leukopenia and penmate controls were in no way affected. In those given M. L. V. without serum, all of the unvaccinated penmate controls developed a leukopenia and an immunity to cholera.—Wm. E. Sipple, D.V.M., Tifton, Ga.

When brooder-raised pheasants are released, they may travel as far as 25 to 30 miles. However, once they select a home they will generally stay within a radius of 1/2 mile of that place.—*Prairie Farmer*, Sept. 20, 1952.



# CLINICAL DATA

## *Clostridium Perfringens* (Type C) in Acute Hemorrhagic Enteritis of Calves

L. A. GRINER, M.S., D.V.M., and FRANK K. BRACKEN, D.V.M.

Fort Collins, Colorado

IN RECENT YEARS, an apparently new infectious disease of baby calves, resembling enterotoxemia of lambs, has been studied at the School of Veterinary Medicine, Colorado A. & M. College. On the basis of gross pathology, the disease has been named acute hemorrhagic enteritis of baby calves. This disease, which appears to be caused by *Clostridium perfringens* type C toxin, is characterized by acute sudden onset, hemorrhagic enteritis, severe hemorrhage into the lumen of the small intestine, and early death.

### REVIEW OF LITERATURE

Examination of the available literature has failed to reveal any reports of acute hemorrhagic enteritis in young calves as herein described. Macrae, Murray, and Grant<sup>1</sup> have published an account of an enterotoxemia in young suckled calves, which was characterized by sudden onset and early mortality. They reported the condition occurred in calves about 3 days of age. The post-mortem findings included gastroenteritis and petechial hemorrhages on internal organs. From cultures of fecal material, they isolated *Clostridium welchii* type A.

### NATURAL OCCURRENCE

In April and May, 1951, acute hemorrhagic enteritis was noted in 6 calves submitted for autopsy at the School of Veterinary Medicine, Colorado A. & M. College. In 1952, 5 such cases were observed in routine autopsies. In addition, the senior author has autopsied in the field 12 animals which showed typical postmortem lesions. However, these animals had been dead too long for bacterial isolation. All cases included in this report were Hereford calves 10 days of age or under, the oldest being 10 days and the youngest 2 days of age. Ac-

cording to reports of stockmen, the greatest loss has been in animals from 3 to 5 days old.

Death losses from this condition have been reported from Jackson and Larimer Counties in Colorado and from Platte County, Wyoming. Undoubtedly, this disease has a wider range than is now recognized since we have received reports of calf losses from several areas in southern Wyoming and northern Colorado that are believed to be due to this condition.

Our observations tend to indicate that calves dying from hemorrhagic enteritis are large, well formed, and apparently vigorous animals. This observation is confirmed by reports from stockmen who have experienced losses. They report that the calves which have died were such healthy, vigorous animals that no sickness was anticipated. They further state that this disease did not occur in small, weak calves. It has also been reported that the calves which have died from hemorrhagic enteritis are from dams that produce an abundance of milk. These observations suggest a similarity be-

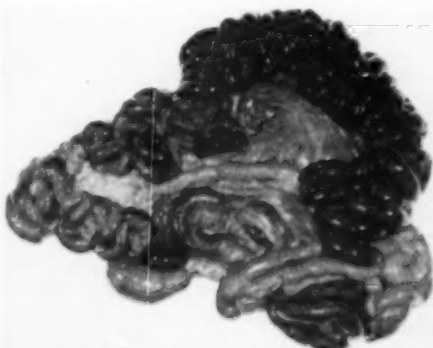


Fig. 1—The intestinal tract of experimental calf 2, illustrating the extensive hemorrhage into the small intestine.

From the School of Veterinary Medicine, Colorado A. & M. College, Fort Collins; Dr. Bracken is now at the School of Veterinary Medicine, Washington State College, Pullman.

tween this disease and "overeating" in lambs. Some stockmen have stated that individual cows have lost their calves for two or three consecutive years from what they now believe was hemorrhagic enteritis.

The extent of the losses from hemorrhagic enteritis is not now available. Losses from 2 to 23 calves have been reported per herd. In 1951, one cattleman lost 23 calves, while in 1952 he lost only 4. The ranch immediately adjoining this property reported the loss of 13 calves in 1952, but only 3 died in 1951.

#### SYMPTOMATOLOGY

Information is lacking for a complete description of the symptoms of natural outbreaks of hemorrhagic enteritis, as all cases reported to us have died before we were able to reach them. According to owners, weakness and prostration are the first symptoms observed, and the calves usually died two to four hours later. Other symptoms reported to us are variable. Some calves have shown acute colic as indicated by straining and kicking at their abdomens. Some present opisthotonus. Scours have been reported in a few cases, with the fecal material being stained with blood; however, most stockmen have failed to observe the evidence of scouring.

No significant blood cellular changes, which would indicate an aplastic anemia, were noted in the one experimental case. Due to the sudden death after onset of symptoms in all naturally occurring cases, we were unable to obtain blood samples for hematological studies.

#### NECROPSY FINDINGS

At autopsy, the disease is characterized by an acute hemorrhagic enteritis of jejunum and ileum with necrosis and desquamation of the mucosa. As much as 15 consecutive feet of the small intestine have shown hemorrhages into the lumen and walls of the intestine. The intestinal contents are deep red (fig. 1). Petechial or ecchymotic hemorrhages have been consistently observed on the epicardium and thymus, and inconsistently in the diaphragm, abomasum, and parietal pleura.

#### HISTOPATHOLOGY

Sections of small intestines showed marked pathology with the principal lesions limited to the mucosa and submucosa. Ex-

tensive hemorrhage and necrosis of the mucosa were noted, with sloughing tissue and blood present in the intestinal lumen (fig. 2). Necrosis was limited to the mucosa, while hemorrhage and hyperemia occurred in both the mucosa and submucosa. Numerous rod-shaped bacilli were present singly and in chains among the debris and red blood cells in the intestinal lumen. These bacilli were gram-positive when stained by the McCallum-Goodpasture<sup>2</sup> method. Microscopically the kidneys, myocardium, thymus, and mesenteric lymph nodes showed areas of hyperemia and hemorrhage scattered throughout the parenchymal and stromal tissues. Hemorrhages were also noted in the perivascular spaces of the brain stem, also.

#### BACTERIOLOGICAL FINDINGS

On direct smear and culture of the intestinal content, the dominant organisms were found to be gram-positive, medium-sized bacilli, morphologically resembling *Cl. perfringens*. These organisms were isolated on blood plates incubated under



Fig. 2.—Photomicrograph of the small intestine of experimental calf 2, showing necrosis of the mucosa, hyperemia, and hemorrhage into the mucosa, submucosa, and muscularis.

anaerobic conditions, then transferred to anaerobic culture mediums. Modified Brewer's medium, as reported by Records and Vawter<sup>3</sup> for cultivation of *Clostridium hemolyticum*, was originally used; however, the desired level of toxin production was not constant. A medium containing equine striated muscle, as recommended by Dr. Montgomerie<sup>4</sup> of the Wellcome Research Laboratories (Beckenham, England), is now being tried. Twelve strains have been isolated and are being used for continued studies. Stormy fermentations are produced in litmus milk.

Bacteria-free filtrates of intestinal content from natural cases proved lethal to mice when administered intraperitoneally and intravenously.

With the aid of *Cl. perfringens* antitoxins, supplied to us through the courtesy of the Wellcome Research Laboratories, the toxin produced by our strains of *Cl. perfringens* has been identified as type C. These findings have been confirmed by Dr. Montgomerie from cultures submitted to him for typing. He has reported the cultures to be good producers of the beta toxin of *Cl. perfringens* type C. It is believed that this is the first report of *Cl. perfringens* type C occurring in the bovine species.

#### EXPERIMENTAL

*Mice.*—Filtrates of intestinal content and broth

cultures have been lethal to mice following intravenous inoculation. The m.l.d. for mice has been found to range from 0.1 to 0.01 ml. in fifteen minutes.

*Calves.*—Attempts have been made to reproduce hemorrhagic enteritis in young dairy calves. After four attempts at reproduction of the disease, success was achieved in one animal. Six vigorous 2- or 3-day-old male dairy calves obtained from local dairies were used in this experiment. All calves were judged to be in good condition at the beginning of the experiment. Temperatures ranged from 100.8 to 101.6 F. Each calf received two feedings of colostrum before the trials started and 2 qt. of skim milk per day while on test. All experimental feedings were made *per os* via a stomach tube.

One case of experimental hemorrhagic enteritis was produced by feeding a whole broth culture of *Cl. perfringens* combined with cornmeal and milk. The lesions produced in this experimental case were identical to those of the naturally occurring disease. At necropsy, extensive hemorrhagic enteritis, petechiation of thymus and epicardium were found. From the intestinal contents collected at autopsy, toxin lethal to mice and cultures of *Cl. perfringens* type C were isolated.

#### SUMMARY

An apparently new, acute, infectious disease of baby calves, somewhat similar to enterotoxemia of lambs but probably caused by *Clostridium perfringens* type C, is described. One typical case of hemorrhagic enteritis was produced experimentally by force-feeding to a dairy calf a pure, viable

TABLE 1—A Summary of Experimental Trials on Hemorrhagic Enteritis in Baby Calves

Animal (No.)	Days	Cornmeal	Milk	Culture		Results
				No.	Dose	
Calf No. 1, Control	first day	200 cc.	800 cc.	.....	.....	remained normal
	second day	200 cc.	800 cc.	.....	.....	
Calf No. 2	first day	200 cc.	800 cc.	236	40 cc. whole broth (48 hr.)	died in 22 hours or less—typical postmortem findings; recovered organism
Calf No. 3	first day	200 cc.	800 cc.	236	60 cc. 48-hr. washed culture (48 hr.)	weakness, killed third day, catarrhal gastritis, recovered organisms
Calf No. 4	first day	150 cc.	850 cc.	243	100 cc. whole broth (48 hr.)	remained normal
	second day	.....	500 cc.	243	35 cc. whole broth (48 hr.)	
	third day	150 cc.	850 cc.	243	100 cc. whole broth (48 hr.)	
Calf No. 5, Control	first day	150 cc.	850 cc.	.....	.....	remained normal
	second day	150 cc.	850 cc.	.....	.....	
	third day	150 cc.	850 cc.	.....	.....	
Calf No. 6	first day	200 cc.	800 cc.	247*	125 cc. whole broth (48 hr.)	remained normal

\*Filtrates from these cultures were not toxic for mice. At this point, we found that our strains, after being maintained for nine months, were losing the power of toxin production. This loss of toxin production was associated with transfer to a new batch of culture mediums.

culture of *Cl. perfringens* type C mixed with cornmeal and milk.

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### Cooking Raw Garbage

The *Farm Journal* (Jan., 1953) carries an article entitled "Let's Make 'Em Cook Raw Garbage" with a subheading "It's a hotbed for disease—and it affects all farmers." It predicts plenty of opposition from garbage feeders who say that it is too much bother, it costs too much, the heat destroys the vitamins, or that hogs won't eat it or won't do well on it.

The first answer suggested is that Canada has been feeding cooked garbage for twenty-six years. Also a Virginia feeder who has over 1,000 hogs on garbage is quoted as saying that his hogs seem to eat the cooked garbage just as well and gain as well, and that it costs only 50 cents to \$1 a ton to cook it. Also his losses dropped from 10 or 20 hogs per month to 2 hogs per month. Furthermore, where he could not start hogs smaller than 80 to 110 lb. on raw garbage, he now can start 40-lb. pigs on the cooked garbage. He admits that it is more work but says he would not go back to the old way.

The article states that this job will require state and federal cooperation. That an effective state law should require: (1) licensing all commercial garbage feeders; (2) inspections to enforce sanitation and cooking; (3) requiring a health certificate for all hogs removed from the establishment; (4) refusing indemnities if the law is not followed. Then the federal government should: (a) enforce the cooking regulations for garbage which moves across state lines; (b) quarantine states which allow the feeding of raw garbage except for direct shipment to market for slaughter and processing; and (c) refuse indemnities to states which do not enforce garbage-cooking laws.

It concludes that "it looks pretty silly to allow unsanitary, unsafe conditions in a \$50,000,000 garbage-feeding business to threaten the welfare . . . of the nation's livestock [industry] . . . a \$21 billion business."—*Farm J.*, Jan., 1953.

### Report on Garbage Feeding

A questionnaire asking for information about the garbage feeding laws and intentions was sent by the AVMA to officials in each state and territory in the U. S., and to each province in Canada recently. Replies received from 40 states reveal that eight now exercise some control over feeding garbage to swine, 13 have laws which will provide for such control without further legislation, and most of the others intend to seek such legislation.

The states which report that they are exercising some control are: Alabama, Florida, Illinois, Kansas, Louisiana, Nebraska, Oregon, and Washington. Others which have not been heard from may belong on this list.

The 18 which estimated how many garbage feeders in their state feed over 100 hogs per year reported from three to 450 such herds each. They averaged 105 herds per state. California, Louisiana, Maryland, Massachusetts, Minnesota, Pennsylvania, and Virginia each reported 100 or more of such herds. Others not yet reporting undoubtedly belong in this group.

### Insecticide Birth Rate

A zoölogist has learned that while insecticides may greatly reduce the number of insects for a short time, the pests may reproduce faster afterward and be more of a problem than ever. Pairs of fruit flies that had survived exposure to dieldrin laid 5 per cent more eggs than did the controls. Since a normal pair can produce 160,000 offspring in two generations and 14 generations are normal for a season, eventually a 5 per cent increase would be quite an item. —*Sci. News Letter*, Dec. 6, 1952.

Virulent hog cholera virus has apparently been recovered in a few instances from pigs which "reacted" to the new modified virus vaccines.—*L. M. Hutchings, D.V.M., Purdue University*.

## Observations on the Bovine Hemorrhagic Disease Caused by Trichloroethylene-Processed Soybean Oil Meal

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TRICHLOROETHYLENE-processed soybean oil meal was shown to be the inciting cause of a bovine hemorrhagic disease in ten Hawaii dairy herds. The clinical syndrome and postmortem lesions were in agreement with previous descriptions of the disease. The purpose of this report is to record some observations on the presence of concurrent bacterial diseases and the effect of treatment.

### OBSERVATIONS

In the first affected herd, 5 cows had died over a period of four days before a veterinarian was called. Initial examination revealed depression, anorexia, high fever, and hemorrhaging from body openings. Autopsy showed petechial to ecchymotic hemorrhages of all organs and structures. Lung and spleen samples sent to the laboratory contained numerous gram-negative bipolar rods which were later typed as *Pasteurella multocida*. A tentative diagnosis of hemorrhagic septicemia was made and a search for an inciting cause was instituted.

Questioning the owner elicited no information pointing to an inciting cause. No animals had been imported for approximately two years, no inclement weather had been experienced, and there had been no apparent change in feed or feeding practices. Treatment was instituted on the basis of the tentative diagnosis. The herd was vaccinated with hemorrhagic septicemia bacterin and daily injections of 10 Gm. of dihydrostreptomycin, 3,000,000 units of penicillin, and 250 cc. of an intravenous sulfonamide solution were given to all sick animals. At the time treatment was instituted, 8 animals had died and 36 more were ill. The herd contained 96 head.

By the third day of treatment, death losses stopped and affected animals dem-

onstrated a declining temperature and general improvement. New cases, however, were occurring daily. On the fourth day, numerous treated animals began to relapse and death losses resumed.

After eight days of treatment, another outbreak was reported in a second herd. The location of the second herd made it improbable that the disease had been accidentally introduced from the first herd. The only common factor in the two herds was the brand of soybean oil meal fed. The label on bags of this meal bore no information concerning the extraction process but subsequently the Bureau of Animal Industry identified it as being processed with trichloroethylene. Requestioning the owner of the first herd brought out the fact that he had received a new shipment of soybean oil meal about a month before the outbreak. He had not reported it as a change of feed because it had merely been a new shipment, not a new feed. Feeding this brand of soybean meal was then discontinued on both farms and efforts were made to trace the rest of the shipment. A sample of the suspected meal was obtained from each dairy for feeding trials. All sick animals in the second herd were given hemorrhagic septicemia serum and the remainder of the herd was given bacterin. At the owner's request, no other treatment was given.

While the incriminated feed was being located and recalled, eight outbreaks occurred on two other islands. In these subsequent outbreaks, the soybean oil meal was immediately eliminated and treatment was instituted as in the first herd. The results of this treatment are given in table 1.

In one of the subsequent outbreaks, the first animal to die had pneumonia in addition to the hemorrhagic lesions. *Pasteurella multocida* was isolated from the tissues of this cow. In another herd, a cow aborted during the course of the hemorrhagic disease and quickly succumbed to metritis. In still another herd, 2 cows

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Acknowledgment is made for help received from the practicing veterinarians in the territory. The author's position is that of reporter; the observations were made by many.



developed an acute mastitis. One of these cows died as a result of the mastitis and the other made a gradual recovery.

The samples of soybean oil meal obtained from the first two affected herds were fed to 4 healthy 6-month-old Holstein-Friesian calves. One pair of calves was fed soybean meal from each herd. A third pair was fed expeller-processed soybean meal as controls. After thirty-five days, all calves fed the incriminated soybean meal were dead. The controls were healthy. The clinical syndrome in the experimental calves was characterized by fever, anorexia, dyspnea, bleeding from body openings or slight traumatic wounds, prolonged clotting time, and a marked leukopenia with nearly 100 per cent lymphocytes in the differential count. The autopsy was characterized by subcutaneous, submucous, subserous, subperiosteal, and intramuscular hemorrhages that were usually ecchymotic but varied from petechial to suffusion. The experimental disease was essentially the same as the naturally occurring disease.

#### DISCUSSION

During the course of the feeding trial, it was noted that there was a marked reduction in both the total leukocyte count and the number of circulating neutrophils before the animals became clinically ill. Since the circulating neutrophils constitute an important body defense mechanism, af-

fected animals should be more susceptible to infection. Potential pathogens carried by the animals would be expected to produce disease. Chronic diseases in animals so affected should have acute exacerbations. Such developments were observed in field cases where trichloroethylene-extracted meal was fed.

The fact that the leukocytes were reduced before the animals became clinically ill would also suggest that medication at this time, directed against common secondary invaders and potential pathogens, might protect the animals until the leukocyte count returned to normal.

Treatment of this type was instituted in eight of the ten affected herds. In these herds, the mortality was much lower than in the first herd where soybean meal was not excluded from the ration during the first eight days of treatment and in the second herd where soybean meal was excluded but the animals received no medication other than the hemorrhagic septicemia serum and bacterin. The more satisfactory recovery rate in the final eight herds may have been due to a lower consumption of the incriminated meal. Since only the rate of feeding is known and not the total amount of feed consumed, the only common factor is that all herds were fed sufficient meal to produce the typical clinical syndrome.

TABLE 1—Effects of Treatment

Herd	Method of handling	No. of animals in herd	Approximate amount of soybean fed daily	Morbidity	Total mortality	Mortality after treatment
1	A <sup>1</sup>	96	6 lb.	96	52	44
2	B <sup>2</sup>	Cows 87 Calves 48	Cows 6 lb. Calves 2 lb.	Cows 87 Calves 48	Cows 47 Calves 48	—
3	C <sup>3</sup>	25	3 lb.	17	2	1
4	C <sup>3</sup>	43	8 lb.	31	8	5*
5	C <sup>3</sup>	24	2 lb.	22	2	0
6	C <sup>3</sup>	29	2.5 lb.	17	3	2
7	C <sup>3</sup>	49	2 to 3 lb.	35	5	4
8	C <sup>3</sup>	19	2 to 2.5 lb.	6	1	0
9	C <sup>3</sup>	20	2 lb.	5	2	2
10	C <sup>3</sup>	21	2 lb.	12	0	0

A<sup>1</sup> Animals treated, soybean continued for eight days. B<sup>2</sup> Animals not treated, soybean discontinued. C<sup>3</sup> Animals treated, soybean discontinued.

\*Three of the 5 deaths after treatment of the animals in herd 4 resulted from relapses caused by the owner refeeding soybean oil meal.



#### SUMMARY

1) Trichloroethylene-processed soybean oil meal was the inciting cause of a bovine hemorrhagic disease in ten Hawaii dairy herds.

2) The naturally occurring disease was reproduced by feeding healthy calves with samples of the same soybean oil meal as had been fed to the first two affected herds.

3) The disease was clinically characterized by fever, anorexia, dyspnea, bleeding from body openings and a marked leukopenia with nearly 100 per cent lymphocytes. The autopsy was characterized by hemorrhages in all organs and structures.

4) Treatment of affected animals without elimination of the soybean meal resulted in high mortality in herd 1.

5) Elimination of the soybean meal without treatment resulted in high mortality in herd 2.

6) Several deaths in affected cattle were considered to be the result of secondary bacterial infection.

7) Treatment of affected cattle and elimination of the soybean meal resulted in low mortality in eight herds.

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#### Oral Use of Penicillin Ammonium

To test the ammonium salt of penicillin, 42 volunteer men and women were given either 1,000,000 or 500,000 units orally, either forty-five minutes before or one hour after breakfast, on several consecutive days. Their serum-penicillin concentration attained its peak within one hour and, except in the cases of the smaller dose given after breakfast, maintained therapeutic levels for at least six hours.

Administration before breakfast gave much better results. The serum concentrations were essentially the same as with the potassium salt of penicillin. When given orally, the dose of penicillin should be about

five times as great as when given intramuscularly.—*Canad. J. Pub. Health, Sept., 1952.*

#### Mercury Poisoning in Swine

One of 12 sick pigs in a herd was typical of many others seen recently at the University of Georgia, College of Veterinary Medicine. It had been sick for two or three days, was stiff, would stagger, eat little, act blind and stop walking only when it collided with an object. Its temperature was 104.2 F. It would respond slowly to external stimuli and had glossopharyngeal paralysis. On autopsy, microscopic section revealed cloudy swelling and pale cellular cytoplasm of the hepatic cells, marked tubular degeneration in the kidneys, and congested meninges. The diagnosis was mercury poisoning. For three months, these pigs had been fed on wheat, part of which had been treated eighteen months before with ceresan for smut control.—*Southeast. Vet., Summer, 1952.*

Some chickens, vaccinated intranasally against newcastle disease when 2 days old, retained enough immunity when challenged at 9 months of age to show no symptoms, but their egg production dropped to 40 per cent of normal.—*J. D. Alberts, D.V.M., University of Illinois.*

Hypoglycemia will occur in a newborn lamb or a calf if starved as it will in a pig, since they can not make blood sugar until they are older.—*Jesse Sampson, D.V.M., University of Illinois.*

In controlled experiments, when strain 19 vaccinates are challenged with a sufficiently virulent *Brucella* infection, one-third as many will become infected as in the unvaccinated control group.—*B. T. Simms, D.V.M., Chief, U. S. Bureau of Animal Industry.*

A stomatitis, probably micotic, affects 2 or 3 cattle in each of many herds in southern Indiana. It is also reported in states south and west from there. This is a drouth region.—*J. W. Green, D.V.M., Indiana.*

## ***Pneumonyssus Caninum* in the Nasal Cavity and Paranasal Sinuses**

### **A Report of Its Occurrence in Eight Dogs**

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THE FRONTAL sinus and nasal mite, *Pneumonyssus caninum*, has been reported several times in the literature. Since the reports are from distant places, these mites evidently are wide in distribution.

The first report and description was by Chandler and Ruhe<sup>1</sup> (1940) who found the mite in the frontal sinus of a male Boston Bulldog with a clinical picture of nephritis complicated by prostatitis. Monlux<sup>2</sup> (1940) from New York also

with these nasal mites. The same mite was reported by Monlux and Turk<sup>3</sup> (1951) from a dog in Texas, with a second report from the same state by Monlux<sup>3</sup> (1951) of several dogs with nasal mites. They reported there was no information available as to the pathogenicity of these mites. Douglas<sup>4</sup> (1951) reported on the presence of the mite in 2 dogs from California, where again no pathology was observed which could be attributed to the mite. Gordon and Keep<sup>5</sup> (1951)



Fig. 1.—Wall of frontal sinus showing over 40 white mites which were identified as *Pneumonyssus caninum*. x 4.

reported on a similar mite accidentally found at autopsy in the sinuses and nasal passages of 3 dogs. In 1943, Martin and Deubler<sup>6</sup> reported on 3 dogs from Pennsylvania which were infected

reported, from Australia, a dog with mites that were picked from the animal's nostrils.

Most of these reports suggest neither lesions nor symptoms attributable to the mites. In several cases, the mites were

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observed crawling from sleeping dogs' nostrils.

The life cycle is unknown and only the female has been found and described. The mature female contains a fully developed embryo which almost fills the abdomen. The mites are probably viviparous. The transmission from animal to animal is unknown but probably is by direct contact.

#### A REPORT OF EIGHT NEW CASES

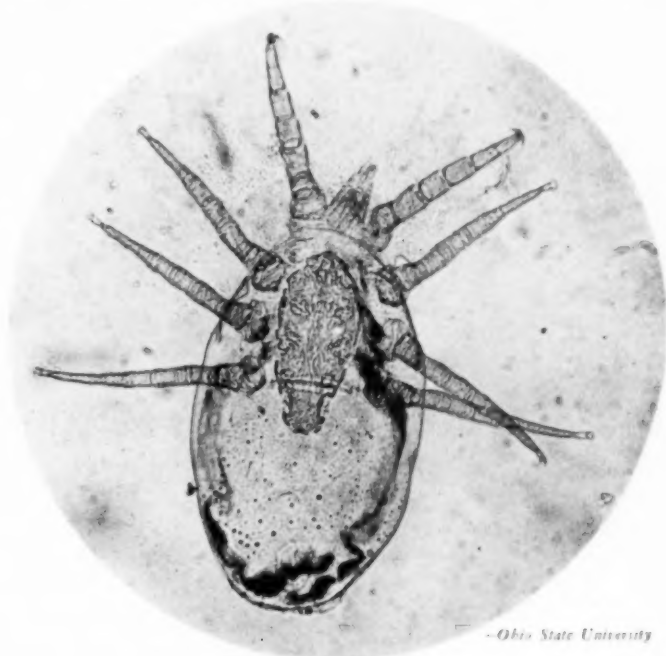
The parasite, *P. caninum*, was discovered during necropsy of 8 dogs; 7 were admitted as patients to the Ohio State University veterinary clinic, and the eighth was submitted by Dr. Robert F. Cross of Hawaii.<sup>8</sup> With the exception of 1 dog from Hawaii, all animals originated from Ohio. Three of the affected animals were males and 4 were females ranging from 2 to 10 years in age. The following breeds were represented in this series: Coon Hound, Cocker Spaniel, English Setter, German Shepherd, Great Dane, and a crossbred Terrier. Most of these animals had a long course of illness followed by natural death or euthanasia. At no time did the history or clinical observations during hospitalization reveal any

signs attributable to these parasites in the paranasal sinuses or nasal cavities.

The finding of nasal mites could not be correlated with the occurrence of any other specific disease since the necropsy diagnoses included glaucoma, osteomalacia, histoplasmosis, and toxoplasmosis, respectively. At the time of autopsy, the white crawling mites were discovered in the nasal cavity and frontal sinuses. Gross examination of these cavities was made by sawing transverse sections through the head. The parasites could be seen with the unaided eye and appeared like small particles of bone sawdust. These minute, white mites crawled actively through the nasal turbinates and over the mucous membrane of the frontal sinuses.

Greater activity was observed as the postmortem interval increased and parasites could be seen moving away from their habitat and onto the surface of the head and necropsy table. The degree of infection varied from 12 to more than 100 in number (fig. 1). In spite of the large number of parasites, the gross lesions were not remarkable. Accumulations of mucus on the mucous membranes and mild hyperemia were the only gross lesions ob-

Fig. 2—Dorsal view of female *Pneumonyssus caninum*, x 50.



—Ohio State University

Fig. 3—*Pneumonyssus caninum*, adult female with egg in abdomen.  $\times 50$ .



—Ohio State University

served. Mites caught in or on the mucus were unable to move as freely as those on the clear mucous membranes. Cross sections of the nasal septum, turbinate bones, and walls of the frontal sinuses sawed  $\frac{1}{8}$  in. thick were fixed in 10 per cent formol saline, decalcified in Von Ebner's solution, embedded in paraffin,

sectioned, and stained with Harris' hematoxylin and eosin.

Except for excessive mucus production, no lesions were seen microscopically in any of the tissues of the upper respiratory tract. It is concluded that the mite, *P. caninum*, is not responsible for recognizable disease since the history and physical

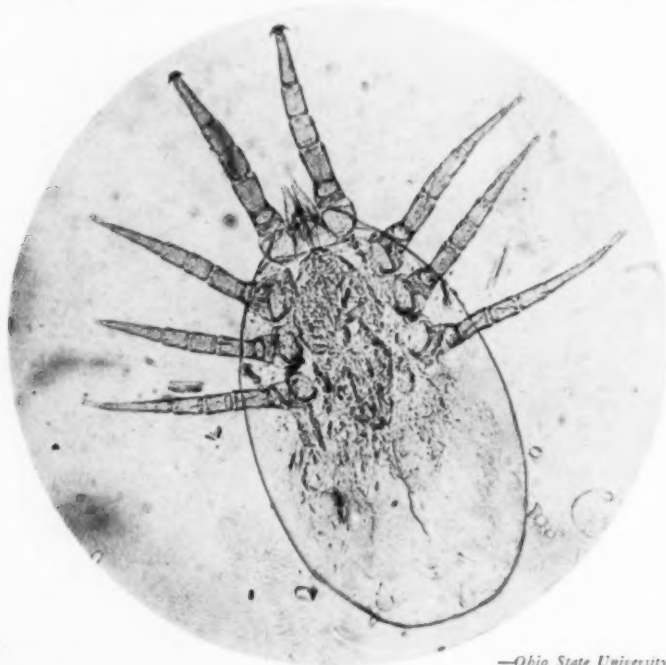


Fig. 4—Ventral view of female, *Pneumonyssus caninum*.  $\times 50$ .

—Ohio State University

examination revealed no signs referable to the paranasal sinuses or nasal cavities. Except for excessive mucus production by these lining mucous membranes, no gross or microscopic lesions attributable to the mite were found.

A detailed description has been given by Chandler and Ruhe<sup>1</sup> in their article describing the mite as a new species. The following is a summary of the principal parts. The body is oval, a pale yellow, and approximately 1.0 to 1.5 mm. in length and 0.5 to 0.9 mm. in width. They are usually found in the nasal passages and sinuses. They are quite active but they might be overlooked, especially where a saw has been used to open the head, for they resemble the dust from sawed bone.

The adult and nymph have four pairs of legs, while there are only three pairs in the larval forms. The legs are well developed and vary in length with their divisions listed as a basal coxa, a short trochanter, longer femur, shortened tibia and protarsus, and a tapering tarsus. The first pair are stout with a pair of curved, heavily chitinized, brown claws on the tarsus tip. The pulvillus, strongly chitinized, lies as a low knob between the claws. The tarsi of the second, third, and fourth pairs of legs have a long-stalked sucker ambulatorium with two long, slender, curved claws below the lobed caruncle.

The capitulum is described as quadrangular with the anterior part being slightly narrower than the posterior. The hypostome is bifid. The chelicerae are clearly outlined, well developed, and capable of moderate extension. The palpi have five segments with the basal, second, and third segment being broader than long, the fourth nearly square, and the fifth elongated with two tactile bristles one on the inner side being longer and stouter than the one on the outer side.

The anal plate, roughly oval, is situated ventrally in the midline and near the posterior body edge. In the anal plate are three prominent setae, the smaller one being posterior to the anal slit, with two larger ones being lateral and anterior to the anal opening.

The vulva is a transverse slit, running between the fourth coxae, near the posterior edge of each.

The club-shaped peritremes are on the

ventral lateral surface, above and between the third and fourth coxae. They have a well-chitinized wall with the rounded spiracular opening situated at the posterior end. The stem is directed anteriorly and laterally.

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*Hookworm Larvae Infects Hamsters with Anthrax.*—Attempts were made to infect hamsters with anthrax by four methods. Those inoculated subcutaneously died in twenty-four to thirty-six hours. Those in which the *Bacillus anthracis* suspension was fed or was brushed onto the skin remained healthy. In the fourth group, the larvae of *Necator americanus* were placed upon skin which had been painted with suspension. These hamsters died in forty-eight to ninety-six hours.—*Vet. Bull., Sept., 1952.*

The Oregon Agricultural Experiment Station is testing the extent to which insects have become resistant to DDT. By using radioactive DDT, they can measure the amount which is absorbed by the insect. Although mosquitoes from DDT-treated areas have absorbed six times as much as those from untreated areas, 20 per cent fewer will die.—*U.S.D.A.*

A chicken with avian encephalitis (epidemic tremor) usually can be felt to buzz like a tuning fork after it is shaken.—*H. E. Moses, D.V.M., Purdue University, Lafayette, Ind.*



## Canine Distemper-Hepatitis Complex

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THE CANINE distemper-hepatitis complex today represents an outstanding challenge to the small animal practitioner. This is due to a number of reasons including an apparent increase in number of cases coming under this classification, inadequate means of differential diagnosis, inadequate means of immunization, and last but not least, the disturbing vagueness which surrounds all viral diseases. There is an incomplete understanding as to what is a virus; how it multiplies; where and how it exists between outbreaks; how it spreads from patient to patient; and other similar questions.

Many small animal practitioners who were in World War II were impressed, when they returned to practice, by an apparent increase in the number of "distemper breaks" following so-called "standard methods" of immunization; methods which had been reasonably satisfactory in prewar years.

There was a feeling among many of them that "something new" had been added to the distemper picture. There was present in the minds of some of them a vague uneasiness over the widespread use of sulfonamides in the treatment of distemper (for secondary invaders), and there was genuine alarm over the marked increase in number of encephalytic complications following distemper.

### THE DISTEMPER-HEPATITIS COMPLEX

It has been well established that canine distemper and infectious canine hepatitis are separate entities and caused by different viruses.<sup>4,8-11</sup> They often occur singly, although concurrent infections are not uncommon. Differential clinical diagnosis is not merely a difficult process; it is often impossible without tedious and expensive laboratory procedures, and yet every small animal practitioner daily meets this chal-

lenging situation and is forced to come to a decision regarding it.

Without discussing all the minor details regarding canine distemper, which have been so thoroughly covered in the literature, a brief review of some of the salient features of both diseases will be presented with the view of making comparisons and drawing attention to differences that are important.

### CANINE DISTEMPER

Canine distemper virus was isolated by Carré<sup>4</sup> in 1905, and the work of Laidlaw and Dunkin<sup>8</sup> in 1926 established it as the true etiological factor. The incubation period usually varies from three to five days. The virus is air-borne and thus the disease spreads rapidly within a group of susceptible dogs.

Symptoms vary with the two stages of the disease: (1) viremic stage, which lasts about ten days; and (2) complication stage, which appears from the tenth to the thirtieth day.

Symptoms of the viral stage of distemper are the well-known inappetence and depression; diphasic temperature (often missed clinically); vomiting, at least a few times; lacrimal discharge (constant); mild rhinitis; skin eruptions, as seen in many other viral diseases; and often a diarrhea that may be mild or moderately severe.

Many dogs go through the viral stage in a subclinical form and become immune for life. The owner of such a dog may insist that his animal has never had distemper. Good nutrition, good sanitation, and proper housing play an important part in the uneventful recovery of these cases.

Many other dogs go through the viral stage with symptoms of varying severity, but make an uneventful recovery. Here again, adequate vitamin, mineral, and caloric intake are probably important protective factors, but apparently environmental conditions also play a part. Dogs that get wet and chilled during or immediately after the viral stage are apt to go into the complication stage. Other debilitating factors which tend to produce complications

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are hunger, fatigue, and excessive heat or exercise. Recent research work by MacIntyre<sup>9</sup> and also by Verlinde<sup>12</sup> indicates that the sulfonamides may also be a factor in producing encephalitis.

*Three Types of Complications.*—In general, three types of complications are observed:

1) Intestinal — an acute or subacute gastroenteritis. This type is less common in some areas than others, but is seen everywhere occasionally and may be quite severe. Aureomycin, terramycin, and dihydrostreptomycin are effective in treating it and clinical experience indicates that they are probably important factors in preventing it.

2) Pneumonic — common in lower altitudes and high humidity areas and fairly uncommon in the mountain states. Penicillin and sulfonamides are effective in treating it.

3) Encephalitic — most common type in many areas and the symptoms are of three types: convulsive, choreic, and paralytic. These frequently are referred to as "nervous distemper."

*So-called "Nervous Distemper."*—So-called "nervous distemper" has been the subject of considerable research since 1945. There seems to be considerable agreement at present that the virus of Carré,<sup>4</sup> the "hard-pad" virus of MacIntyre,<sup>9</sup> and the encephalitis virus of "nervous distemper" as isolated by Hurst<sup>6</sup> and others, are identical. Certainly they are immunologically similar.

A number of interesting explanations have been made as to why distemper convulsions (chorea or paralysis) may appear in eighteen to thirty days following initial exposure to the virus:

1) Some viruses, as rabies, travel exclusively along the nerve trunks. They always travel slowly.

2) Some viral diseases of man, such as mumps and measles, occasionally give rise later to encephalitic symptoms similar to those in canine distemper.

3) Equine encephalitis has been shown by Hurst<sup>7</sup> to have two stages: viremic or systemic, and encephalitic. He showed that animals that have recovered from the viremic stage and have a good antibody titer in their blood may die when the same virus is later injected intracerebrally.

4) Poliomyelitis in man has been proved to have two stages; a short viremic and

a longer, much more severe neurotropic stage. Canine distemper is similar in this respect.

5) MacIntyre<sup>9</sup> produced encephalitis in dogs by giving a full dose of sulfonamides for eight days following subcutaneous injection of distemper virus.

6) Verlinde<sup>12</sup> found that some exogenous or endogenous toxic substance was necessary, in addition to distemper virus, to produce encephalitis in dogs. He found that the sulfonamides served adequately for this purpose.

7) Hurst<sup>6</sup> produced encephalitis repeatedly in dogs by intracerebral inoculation of ordinary canine distemper virus.

*Sulfonamides and Encephalitis.*—In the light of the above findings by qualified workers, it would seem justifiable to assume that so-called "nervous distemper" is merely a later manifestation of the virus of Carré and that the persistent use of sulfonamides in treatment of distemper may well be a factor in the increase of nervous complications in the immediate postwar years.

Clinical observations seem to bear out the sulfonamide theory, as a recent swing away from them, with emphasis on antibiotics such as aureomycin, terramycin, and chloromycetin has, in the opinion of some practitioners, resulted in fewer cases of "nervous distemper."

#### INFECTIOUS CANINE HEPATITIS

Infectious canine hepatitis is an acute disease of dogs, caused by a specific virus which Rubarth<sup>10</sup> and others<sup>2,10</sup> have shown to be identical with the virus of fox encephalitis which was isolated by Greene.<sup>5</sup> This situation is apt to be misleading in the minds of many practitioners, for the disease takes on markedly different manifestations in the two species. In dogs, the disease is essentially hepatitis, with marked involvement of cells of the endothelial system as a whole; in foxes, the principal lesions are found in the brain, and the principal symptom is encephalitis. Baker<sup>2</sup> and others have stated that central nervous symptom lesions are extremely rare in dogs which have infectious canine hepatitis.

A parallel to this situation, however, is to be found elsewhere in medical literature. Anderson<sup>1</sup> calls attention to the fact that yellow fever virus, when injected intracerebrally into mice, will produce an enceph-

alitis and, by this passage, loses its ability to produce hepatitis in monkeys, as it did originally.

**Incubation Period.**—The incubation period in dogs in natural cases is four to nine days.<sup>2,10</sup> Baker<sup>2</sup> found in experimental work that the incubation period varied according to the route employed:

Subcutaneous.....two to three days.

Oral.....four to six days.

Contact with infected dog.....six to nine days.

It has been shown also by Baker that this virus is not air-borne, but spreads largely by ingestion. A 6-in. space between infected and susceptible puppies was enough to prevent spread of the disease. This raises the important question of sanitation in veterinary hospitals. Attendants' hands and clothing, and water and feed pans as well as instruments, can clearly be the means of spreading the disease.

**Incidence of Hepatitis.**—The disease is apparently much more prevalent than was first supposed. Using the complement-fixation test, it has been shown by Rubarth<sup>10</sup> that 70 per cent of the dogs in Sweden had infectious canine hepatitis antibodies in their blood; Baker<sup>2</sup> found 55 per cent in New York; and Brunner<sup>3</sup> found 45 per cent in Switzerland.

The disease, like distemper, is essentially a disease of young dogs, although if a dog does not come into contact with the virus in early life, it is apparently susceptible at a later time. Rubarth's natural cases showed 149 under 1 year of age, 10 cases between 1 and 2 years, and 4 cases over 2 years. This is similar to the findings in the United States.

**Mortality.**—In general, mortality from infectious canine hepatitis is not high. The deaths that do occur are usually early in the course of the disease—from the second to the fourth day.<sup>2</sup> Baker<sup>2</sup> showed a 10 per cent mortality in experimental cases. Smith<sup>11</sup> had no deaths in a small group of experimental cases in Ontario, Canada. Mortality in clinical cases in Salt Lake City, Utah, is estimated at 10 per cent or less.

**Symptoms of Hepatitis.**—The symptoms, especially in the early stages, are nearly identical with those of canine distemper. There is inappetence, depression, vomiting, conjunctivitis, and a high temperature. The

temperature is not diphasic as it is in distemper. This is of doubtful differential value in clinical cases, however, for the diphasic temperature curve is usually gone before the distemper case reaches the practitioner. Extremely high temperatures (above 104.5 F) are suggestive of infectious canine hepatitis in the minds of many practitioners. Tonsillar enlargement, with a loose type of cough, is also suggestive, and corneal opacity, which occurs in about one third of the cases in later stages of the disease, is almost pathognomonic and is definitely a good prognosticatory sign.<sup>2,10</sup>

It is interesting to note the symptoms which do not occur in this disease:

1) There is no jaundice, which is remarkable in view of the amount of hepatic tissue destroyed.

2) Encephalitis is uncommon and, if present, should lead one to suspect a concurrent distemper infection.

3) Respiratory involvement is also uncommon and apparently occurs only in cases which become chronic.

**Postmortem Lesions.**—The postmortem lesions of infectious canine hepatitis are more specific than those of distemper and are much more diagnostic. The principal ones include:

1) Edematous and hemorrhagic tonsils and lymph nodes.

2) Edema of the gall bladder; constant and diagnostic.

3) Edema of the heart valves.

4) Sanguineous fluid in the peritoneal cavity; often fibrinous.

5) Little loss of weight, as death occurs early in disease.

6) Pleural cavity usually normal.

7) Occasionally, subserous hemorrhages in the kidneys.

**Microscopic Lesions.**—There are several microscopic lesions that are of even greater diagnostic value. They include:

1) Intranuclear inclusions in liver cells and endothelial cells all over the body. (Distemper inclusions are mostly cytoplasmic, and are in epithelial cells.)

2) Subserous edema of the gall bladder with a normal mucosa.

3) Marked central necrosis of the liver lobules with profuse hemorrhage.

4) Edema and hemorrhage of all lymphoid tissue.

5) Edematous heart valves with some myocardial degeneration.

**Immunity.**—One attack of infectious canine hepatitis confers a solid immunity. Vaccines are now available commercially. Those which are made similarly to the Dunkin-Laidlaw vaccine for distemper will probably yield about the same results. Hyperimmune serum (homologous) gives excellent protection for eighteen to twenty-one days and is now available in a bivalent type, protecting temporarily against both distemper and infectious canine hepatitis.

**Treatment.**—Treatment is to a large degree symptomatic and supportive and closely follows that which is effective in canine distemper. Terramycin and aureomycin in relatively large doses have been the sheet anchor for many practitioners in recent months, and the number is growing. The bivalent serum is of a specific value only in the early (viremic) stage of the disease, but normal canine serum can be used advantageously at any time, to maintain a proper plasma protein level.

Glucose-saline solution is also of great benefit in cases that are not taking food or water, that are vomiting persistently, or that have a diarrhea. It should be given twice a day. Vitamin therapy is also important, particularly the vitamin B complex which is lowered by prolonged antibiotic administration.

#### DIFFERENTIAL DIAGNOSIS

Differential diagnosis on the part of the clinician is difficult, if not impossible in many cases, unless recourse may be had to complicated laboratory techniques, such as biopsy of the liver and the complement-fixation test. There are no pathognomonic symptoms. There are, however, certain signs which, taken as a group, will aid the practitioner, and the following are offered with that in mind (table 1).

#### SUMMARY

It is apparent now that "something new" was beginning to appear in the canine distemper picture at the close of World War II, and probably it was not a single entity, but based on two factors:

1) The wide-spread use of sulfonamides in full therapeutic dosage over relatively long periods brought about an increase in the encephalitic type of complication. This is borne out by both research and clinical observations.

TABLE 1—Differential Diagnosis

	Infectious hepatitis	Distemper
1. History	Age, immunization, exposure, etc.	Same.
2. Leukocyte count	Usually less than 4,000.	4 to 5,000 or slightly higher.
3. Temperature	Fluctuates; very high initially; 105 to 106 F.	Diphasic curve is typical.
4. Tonsils	Enlarged, edematous.	Involved only in late stages, usually.
5. Transmission	Slowly if sanitation is good; by ingestion or contact.	Rapidly, due to being air-borne.
6. Sequelae	Keratitis in 1/3 cases terminally. No enceph.	Encephalitis, pneumonia, etc.
7. Postmortem lesions	Enlarged tonsils; thickened gall bladder.	Pneumonia, encephalitis, enteritis.
8. Inclusions	Intranuclear in liver & endothelial cells.	Cytoplasmic in epithelial cells.
9. Serology	Complement-fixation test.	Same.
10. Bleeding time	Greatly lengthened; up to 30 minutes, often.	Normal; 2 minutes on average.
11. Urinalysis	Always albuminuria (interstitial nephritis).	Commonly normal.
12. Fatalities	Occur early in course of disease—2nd to 4th day.	Occur most commonly 10th to 30th day.
13. Anim. Inoc.	Ferrets not affected.	Ferrets killed.

2) Infectious canine hepatitis, while probably present for many years, was rapidly increasing in incidence and it seems probable that, as suggested by Baker recently,<sup>2</sup> many so-called "distemper breaks" in vaccinated dogs are due to infectious canine hepatitis for which we have no completely satisfactory means of immunization at present.

Antibiotics such as aureomycin and terramycin have been proved to have some antiviral action and clinically they appear to be of considerable value in the treatment of both distemper and infectious canine hepatitis. They appear to prevent many cases of distemper, at least, from going into the complication stages. It must be admitted, however, that this could conceivably be due to withdrawal of sulfonamides from the regular course of treatment, rather than due to the antibiotics, or it might be due to a combination of both procedures.

While differential diagnosis is difficult and requires consideration of all the criteria available, postmortem findings in infectious canine hepatitis are quite diagnostic, both grossly and microscopically.

Concurrent infections of distemper and hepatitis increase the difficulty of clinical diagnosis and no doubt cause a marked increase in mortality.

The need for better diagnostic tools is evident, and a chicken embryo type of vaccine for infectious canine hepatitis should be a marked improvement over present types of immunization.

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### Antibiotics in the Treatment of Leptospirosis in Man

In one series, 67 cases of human leptospirosis, caused by three species of *Leptospira*, were grouped when hospitalized and treated with five antibiotics: aureomycin, chloramphenicol, penicillin, streptomycin, and terramycin. Since no group made better progress than untreated controls, it was concluded that the antibiotics had no appreciable effect even when ad-

ministered relatively early in the course of the disease. Other workers have often expressed an opposite opinion but usually they have treated only a few cases.

If the effectiveness of a treatment is to be measured by the reduction in the case fatality rate, only jaundiced patients should be included because almost invariably the nonicteric cases recover spontaneously. Using this criterion, the death rate in 152, variously reported as jaundice cases treated with penicillin, was 22 per cent whereas in 103 cases treated before penicillin became available, the death rate was only 23 per cent. Of the above 67 cases, 28 developed jaundice but only 2 died. However, by chance, none of the 12 untreated controls developed jaundice. Of the treated cases, 13 received aureomycin alone, 9 got aureomycin plus streptomycin, 2 aureomycin plus cortisone, 18 received chloramphenicol alone, 12 streptomycin, 8 terramycin, and 5 penicillin alone.

In other meager reports, 6 of 7 treated with aureomycin recovered, 5 of 8 given streptomycin recovered, 1 treated with terramycin made a rather remarkable recovery, but 2 treated with chloromycetin® died. In 1 experiment on hamsters, infected with *Leptospira canicola*, chloramphenicol was completely ineffective but aureomycin and terramycin seemed beneficial even after signs of infection were present; terramycin was the more effective of the two. It is suggested that perhaps some antibiotics are more effective than the report on the 67 cases indicated.—*Brit. M. J.*, Nov. 1, 1952.

**Folic Acid for Lead Poisoning.**—Folic acid given subcutaneously protected rabbits against six times the lethal dose of lead. Two human patients with lead poisoning responded to treatment with 15 mg. of folic acid per day. One was discharged after eight days; the second who already had lead line marks on the gums was discharged after receiving 225 mg. of folic acid in fifteen days.—*Vet. Bull.*, July, 1952.

**Modern Drugs Cure Glanders.**—A combination of sulfamethazine given *per os* and mallein given subcutaneously cured glanders in horses and mules in Iran.—*Vet. Bull.*, Oct., 1952.

## Legg-Perthes' Disease (Coxa Plana) in the Dog

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IN MAN, Legg-Perthes' disease, or osteochondrosis of the caputal epiphysis, is a disease of the young. It is more common in boys than in girls and it affects one hip more commonly than both.

In the dog, this disease also affects the young. Most commonly it occurs in dogs less than 1 year of age; 3 to 8 months of age is the usual range. Although no information appears to be available concerning the relative frequency of this condition in the two sexes in animals, Schnelle<sup>1</sup> stated that it is most common in breeds of dogs in which the hind legs are straight, with little angulation at the stifle. The wire-haired Fox Terrier and the Boxer are the two breeds most commonly affected with Legg-Perthes' disease, according to Schnelle. Little information is found in the literature concerning the frequency of bilateral, as compared with unilateral, involvement in the dog. Examination of clinical and necropsy records at the Mayo Foundation revealed that the disease most frequently has involved both coxofemoral joints.

### ETIOLOGY

A number of theories have been advanced concerning the etiology of Legg-Perthes' disease in man. Jansen<sup>2</sup> was of the opinion that the condition was caused by congenital and developmental abnormalities. He stated that retarded growth of the fetal envelopes results in imperfect molding of the acetabulum or the head of the femur or both. This results in slipping of the joint and injury to the vessels, giving rise to fragmentation and flattening of the head of the femur. Brailsford<sup>3</sup> cited two families in which defective ossification of the femoral caputal epiphysis was present in some of the children. Hypothyroidism in the young is frequently associated with delay in ossification and development of the epiphysis. Legg<sup>4</sup> and Phemister and associates<sup>5</sup> considered the condition to be infectious after they found streptococci and staphylococci in cultures from the joint. Axhausen<sup>6</sup> explained the bony changes as caused by embolic infarction of the affected bone, with subsequent aseptic necrosis.

Bentzen<sup>7</sup> was of the opinion that trauma, which causes blocking of the periarticular vasomotor nerves and consequent hyperemia of the part, results in rarefaction. He stated that he had pro-

duced bony changes resembling those of Legg-Perthes' disease by the injection of alcohol around these nerves. Brailsford<sup>3</sup> considered that the most frequent factor associated with localized rarefying changes in bones is trauma. A history of injury has been present in about half the cases of Legg-Perthes' disease. He was of the opinion, however, that some factor other than trauma is apparently necessary before Legg-Perthes' disease develops.

In the dog, trauma appears to be at least a contributing factor in this disease,<sup>1</sup> although in the case to be reported no definite history of it was present.

### REPORT OF CASE

A 12-month-old Cocker Spaniel displayed the first evidence of lameness after an oöphorohysterectomy performed by one of us (Anderson). The owner stated that at no time previous to the operation was any lameness evident, but after surgical intervention a gradually progressive, bilateral lameness developed. The owner naturally suspected that this condition was a result of the operation but did not bring it to our attention until six months after its onset.

General examination disclosed that the dog appeared to be reluctant to bear weight on its posterior limbs and in walking would use the muscles of its shoulder and trunk. The muscles of the shoulder were somewhat hypertrophied and the muscles of the posterior limbs were beginning to atrophy, which gave the characteristic appearance of an animal depending almost entirely on its front legs for movement because of pain in the posterior legs. Palpation of the left coxofemoral joint produced a grating sensation and a cracking sound was heard when the joint was extended and flexed. It was evident on palpation that a dislocation was present, but the femoral neck was also thought to be fractured. Pain was manifested when either coxofemoral joint was manipulated. No dislocation, either partial or complete, could be detected in the right coxofemoral joint.

Roentgenological examination disclosed bilateral deformity of the femoral heads, with rarefaction and fragmentation (fig. 1). Although both femoral necks showed scattered regions of osteoporosis, the great-

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est pathological changes were in the femoral heads. The fragmentation of the left femoral head accounted for the grating sensation on palpation and the ease with



Fig. 1—Bilateral deformity of the femoral heads, with rarefaction and fragmentation.

which the femoral head could be dislocated and reduced. The flattening of the right femoral head is characteristic of this condition in the dog.

At necropsy, incision of the capsule of the left coxofemoral joint disclosed several fragments of osteoporotic bone lying free in the cavity of the joint. The gross appearance of the synovial fluid was normal. The articular cartilages covering both femoral heads were eroded, leaving a flattened, pitted surface which extended throughout most of the head down to the proximal epiphyseal line. The articular surface of the acetabulum was smooth, but the lateral margins of the acetabulum showed marked flipping from exostosis.

#### COMMENT

The condition in this dog represents a form of incurable lameness that is difficult or impossible to diagnose without roentgenological examination. Although it is

possible that trauma to the coxofemoral joints occurred at the time of oöphorohysterectomy when the animal was restrained, it is not probable, because this same method has been used routinely without any known accidents in the past. After roentgenological examination and an explanation of the pathological process to the owner, it was understood by him that the disease probably was unrelated to the operation.

This case demonstrates the need for roentgenological examination in conditions of joints that cause lameness. Whenever bilateral involvement of the hips is present in a young dog, Legg-Perthes' disease (coxa plana) should be considered in the differential diagnosis.

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*Wildlife Mortality from Insecticides.* — Aldrin was applied to marsh areas from the air at a rate of 2 oz. per acre and toxaphene at a rate of 1½ lb. per acre. Some ducks and coots were killed, including 37.5 of the ducklings on one marsh. Aldrin was more toxic than toxaphene. The effect was not immediate so mortality may have been due to poison in the water or in the vegetation eaten by the birds. Fish and amphibian life were not affected and no harmful affect upon birds was observed.—*Wildlife Rev.*, June, 1952.



# The Isolation of *Coxiella Burnetii* from *Rhipicephalus Sanguineus* on Naturally Infected Dogs

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THE IMPORTANCE of sheep and goat flocks in the propagation and transmission of human Q fever is a fact well demonstrated by many authors (Babudieri *et al.*, Baldelli, Blanc *et al.*, Caporale *et al.*, Cominopetros, and Mirri *et al.*).

Dogs on sheep farms may be exposed to the agent from fetal membranes or fetuses infected with *Coxiella burnetii*. In addition, the ticks, which dogs frequently carry, take part in the epizootiological cycle of Q fever. These facts brought us to undertake the following researches, the purposes of which were:

- 1) The demonstration of the presence of naturally infected dogs associated with human outbreaks of Q fever.
- 2) The isolation of the etiological agent from these naturally infected dogs by means of ticks fed on them.

## PERSONAL RESEARCHES

Three dogs from two farms, on which human outbreaks of Q fever had developed, were found positive for *C. burnetii* by the complement-fixation test. One of these dogs had been seen many times eating fetal membranes of sheep from which *C. burnetii* had been isolated; this dog was brought to our Institute, and maintained there for about two months, and remained in apparent good health. It presented only a poor nutritional status, which persisted until the day it was killed.

This dog, along with a control dog (negative to the disease), was allowed at intervals to roam in a meadow infested with ticks (*Rhipicephalus sanguineus*). At intervals of five to seven days the ticks, which were well filled with blood, were taken off the dogs and ground in a mortar with the addition of a saline solution. The material obtained, after filtration through gauze and paper, was injected into guinea pigs. At the same time, guinea pigs were injected with citrated blood from each of the 2 dogs.

Other guinea pigs were injected with ex-

tracts of the eggs of ticks collected from the infected dog and from the noninfected control. The eggs were collected and injected approximately twenty days from deposition.

Table 1 shows the results obtained with material from the infected dog. Similar studies conducted at the same time on the control dog gave negative results.

The infected dog was killed after sixty-six days. The only gross lesion found was an enormously enlarged spleen.

## CONCLUSIONS

In two outbreaks of human Q fever, 3 dogs which had contact with the families and the sheep concerned were found to be naturally infected by *Coxiella burnetii* as determined by positive reaction to the complement-fixation test two to ten months

TABLE 1—Infected Dog from Farm A

Guinea pig (No.)	Date of inject.	Material injected	Route	Quant-ity (ml.)	Results in	
					Guinea pigs	Patho-logical lesions
1	5/8/51	tick extract	IP	2.0	+	+
2	5/25/51	tick extract	SC	1.0	+	+
3	5/25/51	dog blood	SC	0.5	+	+
4	5/26/51	tick extract	SC	1.0	+	+
5	5/26/51	dog blood	SC	1.0	+	+
6	5/30/51	tick extract	SC	1.0	—	—
7	6/5/51	tick extract	SC	1.0	—	—
8	6/5/51	dog blood	SC	1.0	—	—
9	6/22/51	tick extract	SC	1.0	+	+
10	6/22/51	dog blood	SC	1.0	+	+
11	7/8/51	dog spleen	SC	1.0	—	—
12	7/8/51	tick extract	SC	1.0	—	—
13	7/8/51	dog spleen	IP	1.0	—	—
14	7/3/51	tick eggs	SC	1.0	+	+
15	7/3/51	tick eggs	SC	1.0	+	+
16	7/17/51	tick eggs	SC	1.0	Dead from toxiconis after injection	
17	7/17/51	tick eggs	SC	1.0		
18	7/17/51	tick eggs	SC	1.0		

IP = intraperitoneally; SC = subcutaneously.

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after the human epidemic. In addition, *C. burnetii* was isolated from 1 of the dogs as long as 110 days after the epidemic. This isolation was accomplished directly from the blood and from ticks (*Rhipicephalus sanguineus*) which had fed on the dog.

The finding of alternate positive and negative isolation results seems to demonstrate that *C. burnetii* is present in the circulation of the dog only at intervals, without a typical septicemic phase, particularly in late stages of infection. Blanc *et al.* were able to demonstrate in dogs a septicemic phase of *C. burnetii* immediately after the parenteral injection of the agent. The point (or points) of localization of *C. burnetii* in the dog is yet to be demonstrated, because we were not able to isolate the agent from the spleen of the infected dog, although this organ was markedly enlarged.

The possibility that *R. sanguineus* could be infected by sucking the blood of infected dogs, suggests that in Italy ticks are playing a role in the cycle of Q fever. The isolation of the agent from tick eggs is an important point, considering the fact that *R. sanguineus* is a three-host parasite and, consequently, may provide an important means of spreading the disease.

An obvious criticism of this work is that we did not demonstrate transmission of the disease by infected ticks feeding on susceptible animals. Limited attempts were made to accomplish such transmission, but the attempts were not successful because of the small number of ticks available, and we were unable to induce the engorged ticks to feed on other animals.

The results of the studies reported herein, along with those reported by other workers, suggest that the dogs and ticks may play an important role in the epidemiology of Q fever. The following possible cycle of transmission may be proposed:

1) Fetal membranes from cattle and sheep may provide an important source of infection for other animals within the herd as well as to man and dogs.

2) The tick may serve as a means of transmission to dogs, sheep, and cattle in neighboring areas.

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The best treatment for frostbite is rapid thawing in a warm bath under sedatives. This was proved with rats with frozen legs.—*Bull. Nat. Soc. M. Res.*, Nov., 1952.

*Atrophic Rhinitis.*—The Southwest Veterinarian (Fall, 1952) reports that a disease in swine, clinically and pathologically identical with atrophic rhinitis, has been found in a herd in central Texas. It was apparently introduced when a boar was purchased from northern Texas.

#### Calf Mortality

In a group of 469 calves, 203 (43.3 %) died of infectious conditions, 206 (43.9 %) of noninfectious causes, and 60 (12.8 %) died under circumstances which precluded a differentiation. The interesting point is that the group is divided so equally between those in which infection was recognized and those in which it was absent. Of the infected group, the majority (131 of 203) harbored *Escherichia coli*. Among the noninfectious conditions, the largest number (100 of 206) was classified under "weak, premature, and abnormal calves and those injured at birth." Losses among both groups were consistently higher during January through April.—*Brit. Vet. J. (Part 2)*, Oct., 1952.

## Canine Atrophic Pancreatitis

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THE OCCURRENCE of this disease, though rarely mentioned in the literature, is common. In 1937, Milks and Stephenson published a paper on diabetes in dogs.<sup>1</sup> Although this paper was devoted to the diagnosis of diabetes mellitus, we were interested in the fact that in 8 of the 10 cases which they reported either no pancreatic tissue was found on autopsy or the pancreas had become atrophied.

It is of interest that they were able to diagnose diabetes mellitus in these 10 animals, while in the 6 cases reported here, only 1 showed evidence of diabetes as indicated by increased blood and urine sugar levels. The remainder of the animals gave no evidence of being diabetic. Mark and Burleigh<sup>2</sup> reported a case of pancreatitis in which there was no evidence of increased blood sugar and in which they hypothesized considerable destruction of the pancreas. Hodder<sup>3</sup> in 1951 reported a case of pancreatitis in a Miniature Poodle. Beam<sup>4</sup> in 1952 reported a case of this disease in a 3-year-old Brittany Spaniel.

Atrophy of the pancreas is reported by Hutyra, Marek, and Manning.<sup>5</sup> The causes listed by them include calculi in the pancreatic ducts, tumors of the head of the pancreas, and various parasitic conditions. They state that "no reliable curative or preventive treatment is known." Runnells<sup>6</sup> states that "pancreatitis is rarely observed macroscopically in domestic animals." Davies<sup>7</sup> observes that "atrophy of the pancreas has been encountered in autopsies of dogs which have suffered from diabetes mellitus."

Boyd<sup>8</sup> observes that in chronic pancreatitis "the pancreas is hard and sclerotic, and there is marked atrophy of the parenchyma and increase of the fibrous stroma. The most probable cause is the repeated entry of mildly infected bile into the pancreatic duct, but of this it is impossible to be certain. As the islets of Langerhans do not belong to the acinar system, they are usually spared, but if the sclerosis is severe the islets are injured, and diabetes is then present. On account of the hardness, the condition is easily mistaken by the surgeon for carcinoma of the head of the pancreas."

It is felt that the difficulty encountered in the diagnosis of this condition is due to (1) no positive indication or symptomatology pointing to the pancreas as the focus of the illness, and (2) a low "index of suspicion" on the part of the examining veterinarian. Adequate laboratory fa-

cilities are a definite advantage in the diagnosis of pancreatic disease. The authors realize that the laboratory facilities of the general practitioner are modest and that a busy practice precludes the use of long and involved diagnostic procedures. With this idea in mind, we have attempted to set forth diagnostic criteria based upon clinical evidence of the disease and with a minimum of laboratory study.

### PHYSIOLOGY

The pancreas is a compound tubulo-alveolar gland which empties into the duodenum by way of the pancreatic ducts. The secreting alveoli are grouped into lobules and these into lobes. The parenchyma is supported by a connective tissue framework.

Chronic interstitial pancreatitis is a fibrosis of the pancreas in which there is overgrowth of the inter- and intra-acinar connective tissue, and frequently a corresponding atrophy of the glandular tissue, producing symptoms of atrophic or interstitial pancreatitis.

The atrophy of the glandular tissue gradually reduces pancreatic secretion. This secretion is composed of several proteolytic enzymes, pancreatic amylase, and pancreatic lipase which splits fats to fatty acid and glycerol. The lack of pancreatic secretion produces a marked change in the feces, which become voluminous, and grey in color. They are of a soft consistency with a characteristic fatty gloss, due to the presence of fat droplets, together with a small amount of fatty acid and soap. The amount of fat digestion in the stomach is slight, and upon encountering the alkaline intestinal juice some of the fatty acid present is converted into soap. If the pancreatic enzyme, lipase, is lacking, the fat, free fatty acid, and soap are not broken down to as great an extent, but pass out of the body in an undigested form. The presence of large amounts of fat, 80 to 90 per cent of which is neutral in the feces, is a diagnostic feature of pancreatic deficiency.

Pancreatic amylase is a major secretion from the pancreas, and the pancreas is the only gland which produces large quantities of amylase. The absence of amylase results

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in defective digestion of carbohydrates and large amounts of undigested carbohydrates appear in the feces, resulting in a rough, bulky stool. Fat coats carbohydrate and the enzymes can not get to the carbohydrate to break it down.

Protein digestion and absorption are little affected, although the nitrogen excretion in the feces is increased when the pancreatic juice is prevented, experimentally, from entering the intestine (Dukes).<sup>8</sup>

#### ETIOLOGY

The condition to be described here is an atrophy of the secreting parenchyma, focal or diffuse in distribution, which may or may not be accompanied by a corresponding overgrowth of fibrous tissue.

In the literature concerning this disease in man, several causes are set forth:

- 1) *Obstruction* of the main duct by carcinomas of the head of the pancreas or of the duodenum at the ampulla of Vater, pancreatic diverticulum, pancreatic calculus, and duct papilloma.

- 2) *Infection* which may reach the gland indirectly by the lymphatics or directly from an infected duodenum or common bile duct.

- 3) *Arteriosclerosis* by diminishing the blood supply.

- 4) *Acute hemorrhagic pancreatitis* occurring in localized areas may be responsible for the production of small scars.

Chronic pancreatitis is not infrequently associated with cirrhosis of the liver.

The cause of chronic interstitial pancreatitis in man is obscure. Whipple<sup>10</sup> indicates that the disease is of unknown etiology, or that the causes are many and varied. This we find to be true of most of the cases we are reporting here. Apart from the production of scars in hemorrhagic pancreatitis, none of the causes of atrophic pancreatitis in man appears to be associated with the etiology of the disease in dogs.

#### SYMPTOMATOLOGY AND DIAGNOSIS

*Symptomatology.*—The general condition is poor. Emaciation is marked. Affected dogs are usually alert, although some may exhibit depression. The temperature, pulse, and respirations are all within normal limits. The visible mucous membranes are normal in appearance. There is no pain exhibited upon abdominal palpation.

Affected dogs have a voracious appetite

and an odor of rancid fat may be detected. Thirst may or may not be increased. Polyuria is not in evidence. The feces are voluminous and have a clay or putty color. The consistency is always soft, resembling the droppings of a cow. The stool has a strong smell and may show only partial digestion. It may be possible to identify the food which has been ingested from the appearance of the feces.

*Laboratory Findings.*—Microscopic fecal examination is negative for parasitic ova. Numerous fat globules will be seen and perhaps undigested meat fibers. The urine is essentially normal, although a slight increase of urine sugar may be present. The cellular elements of the blood and the blood glucose levels are within normal limits.

*Diagnosis.*—In our opinion, the characteristic features described give a specific syndrome and warrant a diagnosis of atrophic pancreatitis provided:

- 1) Emaciation is marked and the onset has been more or less sudden.

- 2) The appetite is voracious.

- 3) A pancreatogenous stool is present, e.g., bulky, steatorrheic, rancid odor, clay or putty colored, and with a more or less liquid consistency.

- 4) The urine is negative when tested for sugar.

- 5) Fat droplets are extruded involuntarily from the anus.

- 6) Microscopic examination of the feces reveals the presence of fat droplets, undigested meat fibers, and is negative for parasitic ova.

With more complete laboratory equipment, it would be possible to determine the blood glucose level and the neutral fat content of the stool.

Kirk,<sup>12</sup> quoting Hutyra, Marek, and Manning states that "the adrenalin mydriasis test with dogs having no pancreas is always positive." This we have not found to be true in the cases we have seen. In fact, none of the animals tested by this method showed any evidence of mydriasis.

*Differential Diagnosis.*—Diabetes mellitus is the disease most easily confused with pancreatitis. However, in the former disease, glycosuria, hyperglycemia, polyuria, and polydipsia are marked, whereas in pancreatitis they are absent. The character of the stool is again a differential point between the two diseases.

Diabetes insipidus produces marked

cachexia and emaciation, and the appetite may be voracious. Here again, the polyuria and polydipsia and lack of the characteristic pancreatogenous stool serve to differentiate these diseases.

#### TREATMENT AND REGULATION

Because the regenerative capacity of the pancreas is feeble and because the etiological agent is seldom discovered or removed, a therapeutic regime of indefinite duration is the only practical approach to treatment.

**Medical Treatment.**—(1) Sorethitan monooleate\* is suggested, with or without bile salts, in a dosage of 1 Gm. three times daily, given before eating or with the meal. This is a wetting or emulsifying agent capable of increasing the absorption of fat from the intestinal contents. It has been noted in some instances that inclusion of the bile salts tends to cause diarrhea.

2) Desiccated pancreatin\*\* U.S.P., 12 gr. daily, may be mixed with the food. The dosage of this and the above drug will vary with the individual animal.

3) General supportive therapy as the patient's condition indicates.

**Dietary Regulation.**—During the initial stages of treatment, the animal should be fed several times a day. In the opinion of the authors, the diet should be made up of the normal percentage of its constituent parts: protein, fat, carbohydrates, etc.

Kirk,<sup>12</sup> however, states that these animals should be fed milk and casein, lean meat, rabbit and mutton, and raw pancreas.

Whipple<sup>10</sup> states that the pancreatic ferment in raw pancreas is inactivated if the gastric juice is normal.

#### CASE HISTORIES

**Case 5135.**—On Jan. 5, 1951, a 17-month-old Corgi bitch was presented at the clinic.<sup>†</sup> From the age of 12 weeks, the puppy had a stool which the owner described as light in color and the consistency of porridge.

The animal lost weight and became dull and listless. Dietary regulation, frequent wormings, and nutritional supplements prescribed by various veterinarians failed to cause any change in the condition of the animal. At 8 months of age, the owner

noticed oily material being extruded involuntarily from the anus, and the animal would eat her own stool. At 15 months, the stool became light gray and looked "like ground cement," according to the owner, and had a foul, pungent odor. At the time the animal was admitted to the clinic, she weighed 11 lb.

Urinalysis showed specific gravity within normal range; there was no evidence of sugar or albumen in the urine. The blood sugar was within normal limits and the blood picture was also normal. Fecal examination was negative for parasitic ova.

A tentative diagnosis of interstitial pancreatitis was made. The owner was advised to feed the animal a normal ration. Medication consisting of sorethitan monooleate and pancreatin was dispensed. The sorethitan monooleate was given as one 0.5 Gm. capsule twice daily; the pancreatin as powder in the food, 0.25 Gm. daily.

At the time of writing (July, 1952), this bitch has gained weight from 11 to 22 lb. If the medication is discontinued for any length of time the previous symptoms recur.

**Case 6431 (Fig. 1).**—On Aug. 22, 1951, a 6-year-old spayed female smooth-haired Fox Terrier was presented to the clinic. The

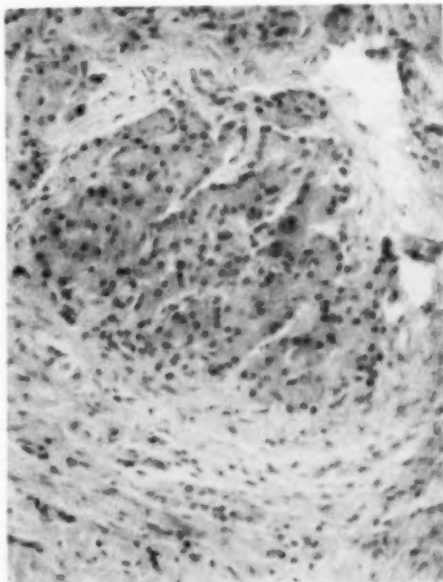


Fig. 1—Photomicrograph of pancreas of case 6431. Note increase in fibrous tissue replacing parenchyma.

\*Sorlate, a trade marked product of Abbott Laboratories, North Chicago, Ill.

\*\*Pancreatin is produced by Parke, Davis & Co., Detroit.

†Ontario Veterinary College, Guelph.



history was sketchy. The animal was markedly emaciated, but the period over which this loss of weight had taken place could not be established.

The animal appeared dull, depressed, and emaciated. The appetite was ravenous, the stool volume greatly above normal, and the stool was grey clay colored with a foul, rancid odor.

Constituents of the urine were within normal range; no evidence was present of increased sugar or albumen. The blood picture and blood sugar were normal.

A tentative diagnosis of disease of the pancreas was made and the animal was given a regimen of sorbothan monooleate for a few days. Because of the poor condition of the animal, euthanasia was performed five days after admittance. No improvement was noted in the stool or in the general condition of the animal at this time.

The postmortem examination showed: liver—degeneration with fatty changes centrolobularly in some areas; other sections showed extreme fatty infiltration with large droplets distending the liver cells to give a signet ring appearance; pancreas—only a few islands of small distorted lobules of pancreatic tissue remained in a mass of mature fibrous tissue, nerve tracts, and blood vessels. Islets of Langerhans were still visible in the lobules. The pancreatic duct was surrounded and its lumen greatly narrowed by fibrous tissue.

The diagnosis was chronic pancreatitis.

*Case 6444 (Fig. 2, 3).*—On Aug. 30, 1951, a 16-month-old male Shepherd-Collie cross-

bred dog was admitted to the clinic. The animal had a history of emaciation and voracious appetite. The diet was fairly

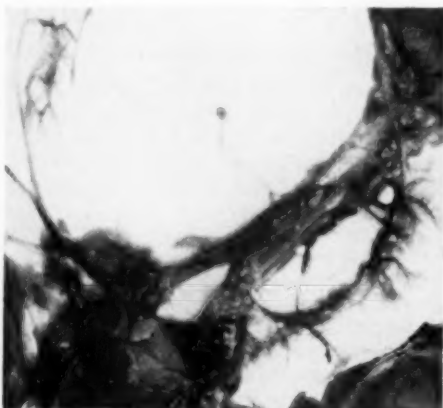


Fig. 3—Note almost total absence of pancreatic tissue in duodenal loop (case 6444).

adequate—a basis of commercial dog food with added table scraps. The stool was described as loose, resembling that passed by a cow. The owner remarked on the offensive odor.

Urinalysis showed no increase in sugar or albumen. The blood picture was normal and no increase in blood sugar was apparent.

A tentative diagnosis of disease of the pancreas was made. Pancreatin and sorbothan monooleate were dispensed to the client.

The animal was returned to the clinic on Nov. 9, 1951. The owner reported that the dog had put on weight. The quality of the stool was better and the odor was not as marked. However, he felt that costs for medicine over a period of years would be excessive and requested euthanasia.

In order to follow a case of this type more closely, the animal was kept (at college expense) for the next two months. The symptoms at the time of the second admittance were as follows:

The temperature, pulse, and respiration were normal. A fecal analysis was negative for parasitic ova. The blood and urine analysis was normal. The dog was emaciated, but otherwise bright. He ate with a voracious appetite. The bowel movements were numerous and abundant. The stools were well formed, putty colored, and had a



Fig. 2—Emaciated animal (case 6444).



distinctively foul odor. Polyuria was not observed. There was no sign of jaundice and the visible mucous membranes were normal. Abdominal palpation revealed no abnormalities.

The medication was given in the following doses and the animal was weighed daily.

Sorethitan monooleate—12 capsules daily, started November 9.

Pancreatin—1.5 Gm. daily, started November 10

3.0 Gm. daily, started November 22

6.0 Gm. daily, started November 27

No pancreatin, November 28 to December 6

6 Gm. daily, December 6 on.

By this method, we were able to maintain the weight of the animal.

The dog was fed three times a day, and the therapeutic agents were divided into three doses and incorporated in the food.

At times, the stool had a better appearance, but when the animal died, the stools were still tan colored.

The histopathological examination showed that in the pancreas there was marked atrophy of the parenchyma. The islet cells appeared to be well preserved and an apparent increase in the fibrous connective tissue was noted. In some sections, there appeared to be an increase in the islet cells.

The diagnosis was chronic pancreatitis.

*Case 6484.*—On Sept. 8, 1951, a black and white spayed female Collie, 8 years of age, was presented for examination at the clinic. The history was meager, with the outstanding symptom being a relatively sudden loss of weight. This weight loss began about one month prior to the date of admittance. The animal was examined routinely and no evidence of infectious disease was present. There was no record of urinalysis, but the blood picture was within normal limits and the blood sugar was 400 mg. (normal is 70-120). On this evidence, a diagnosis of diabetes mellitus was made. Because previous cases of atrophic pancreatitis had been presented at the clinic and because of the presence of grey, putty-like stools with an offensive odor, treatment with sorethitan monooleate as well as insulin was instituted. A second blood sugar determination nine days later showed that it had dropped from 400 mg. to 222 mg. However, the animal showed no clinical improvement and euthanasia was advised. This was done as evidence gathered from previous cases, which

were cachectic, indicated that extensive treatment would result in additional expense with unsatisfactory results.

The histopathological examination showed: liver—marked fatty changes; pancreas—atrophic in nature, there being only a small portion of the gland left. The islets of Langerhans were absent entirely and a great deal of the organ was replaced by fibrous tissue.

The diagnosis was diabetes mellitus.

*Case 6974 (Fig. 4, 5).*—On Nov. 30, 1951, a female Beagle Hound was admitted to the

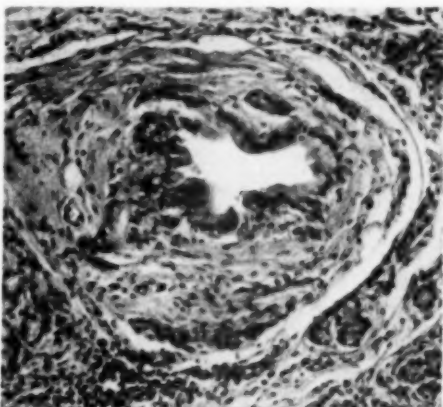


Fig. 4—Histopathology shows an increase in fibrous tissue surrounding the pancreatic duct (case 6974).

clinic. The history was vague. To quote from the letter received with the animal, "the dog has a voracious appetite but is losing weight fast. It seems to be in good spirits (and will run rabbits like nobody's



Fig. 5—Emaciated animal (case 6974).

business). We have tried worming and vitamin tonics."

On examination, the animal appeared to be very thin. The urine was negative for sugar or albumin. The blood picture was within the normal limits. The blood sugar level was normal. Tapeworm segments were evident in the feces.

Treatment was instituted three days after the animal was admitted. It consisted of 0.5 Gm. of pancreatin and 0.5 Gm. capsules of soethitan monooleate. This was continued for fifteen days but no evidence of clinical improvement was noted. The owner requested that euthanasia be performed when it was pointed out to him that medication would have to be continued for the remainder of the animal's life.

The histopathological examination showed: The pancreas was markedly atrophied. The pancreatic ducts remained, but the parenchyma had completely disappeared and all that remained were the islets of Langerhans, fibrous connective tissue, macrophages, and lymphocytes.

The diagnosis was chronic pancreatitis.

*Case 7063 (Fig. 6, 7).*—This animal, a 1-year-old male German Shepherd, was admitted to the clinic on Dec. 11, 1951.

This animal had been the property of the owner since it was a 2-month-old puppy. During all this time, it had exhibited a chronic loose stool and had remained thin. Medication had consisted of worming, tonics, sulfaguanidine, and penicillin. Nothing had had any effect in correcting the condition.

When interrogated, the owner reported



Fig. 6—Animal (case 7063) is thin.



Fig. 7—Note hemorrhagic pancreatic tissue in duodenal loop (case 7063).

that the stool was putty-like in consistency and the quantities were exceedingly large. The odor was reported as being foul.

Fecal examination was negative for parasitic ova. Urinalysis was within the normal limits as was the blood picture and blood sugar. On the above evidence, a tentative diagnosis of pancreatic disease was made.

The owner was not interested in the dog if continued medication was considered necessary. When assured that there was little likelihood of a cure being effected, the owner consented to leave the animal for a few weeks' treatment with the understanding that euthanasia would be performed at the end of that time.

The animal was weighed daily, the weight on admittance being 53 lb. The medication given was soethitan monooleate and pancreatin granules. The condition of the animal improved steadily during the course of medication. After two months, the weight had risen to 66 lb. and the stool appeared normal in color and consistency. At this time, euthanasia was performed. The histopathological report revealed that the pancreas was "essentially normal." However, as can be seen in figure 8, the pancreatic tissue is acutely hemorrhagic. This condition would in all likelihood account for the symptoms.

#### SUMMARY AND CONCLUSIONS

A varying number of animals are presented to the clinic each year manifesting a syndrome which is characteristic of atrophic pancreatitis, chronic interstitial pancreatitis, or hemorrhagic pancreatitis.

At necropsy, most of these animals are shown to have very little or complete absence of pancreatic tissue.

Animals in which this syndrome is de-

tected early enough, that is, before emaciation has become marked, respond to medical treatment with soethitan monooleate and desiccated pancreatin. Some advanced cases will respond to this treatment if insulin therapy is instituted in addition. It is useless to give insulin unless there is evidence of elevated blood and sugar levels.

In view of the fact that the cases of Milks and Stephenson<sup>1</sup> showed similar pathological pictures to the cases being reviewed here, and at the same time were diabetic, it is felt that more work should be done on this problem.

With the exception of the first case presented here, all the animals discussed are those upon which we have been able to perform an autopsy. These cases furnish conclusive evidence of a disease entity—atrophy, interstitial, or hemorrhagic pancreatitis. Other cases have been seen and treated in accordance with the foregoing methods of treatment. These cases were of necessity diagnosed only tentatively. They are, however, for the most part responding to treatment.

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The body can not store large quantities of vitamin C.—*Sci. News Letter*.

## Brazil Ratifies Aftosa Center Agreement

Full development of the foot-and-mouth disease (*aftosa*) center near Rio de Janeiro was recently made possible by the ratification of the agreement of June, 1951, between the government of Brazil and the Pan American Sanitary Bureau. The Bureau will direct the operation of the center, the first of its kind devoted to disease on a continent-wide scale. Occupying 227 acres of land, it will furnish four types of service: diagnostic, field consultation, training, and research. Two types of six-week training courses will be given. One type will emphasize prevention and emergency action for trainees from areas free of *aftosa*. The other type will stress measures to prevent the spread of the disease along with its control and eradication for trainees from infected areas.—*World Health Organization Release, Dec., 1952*.

## Foot-and-Mouth Disease (*Aftosa*) on Martinique

The United States Department of Agriculture announced on Dec. 8, 1952, that *aftosa* had been diagnosed on the Island of Martinique. The United States has acted to prohibit the importation of cattle, sheep, other ruminants, or swine and their meat products from Martinique. Other meats, animal by-products, hay, and straw will be permitted importation from the Island only under stringent restrictions.

*Ascaris in Calves in Australia.*—*Ascaris vitulorum* organisms have been found in calves in Australia for the first time. It is a serious parasite in the Indian water buffalo, the Zebu and other bovine animals in India, the Philippine Islands, and in South France. It is also widely distributed in Europe and the West Indies, and has been infrequently found in the U. S.—*Austral. Vet. J., June, 1951*.

The intradermal inoculation of cattle with freeze-dried lapinized rinderpest virus protected them against a challenge with virulent bovine rinderpest virus. The amount of vaccine required was thus reduced twenty-fold.—*Vet. Bull., Aug., 1952*.

# NUTRITION

## Notes from the Cornell Nutrition Conference for Feed Manufacturers Nov. 6, 7, 1952

### Recent Studies on Ketosis in Dairy Cattle

Ketosis symptoms may be grouped as digestive or nervous. In either case, the blood analysis shows a low sugar and a high ketone body value.

Fatty acids (except propionic) are the principal precursors of the ketone bodies, the conversion occurring in the liver. Fatty acids are derived from the breakdown of body fat and from the rumen.

In the rumen, the bacterial fermentation produces acetic acid (65 %), propionic acid (20%), and butyric acid (15%). The ketogenic properties of these acids were determined by rumen puncture in the goat and continuous drip of a solution into this organ.

Acetic acid raised the ketone bodies in the blood, but this was balanced by an appreciable rise in the sugar level as well. Propionic acid left the ketone bodies the same but raised the blood sugar level markedly. Butyric acid raised the ketone level markedly, and this was followed by a drop in sugar level. Therefore, propionic acid is definitely helpful in preventing or alleviating the blood disturbances found in ketosis, acetic acid is mildly helpful, and butyric acid is very undesirable.

All ketosis cows showed a low assay in total acids per unit of rumen liquor but little disturbance in proportion of the three acids. To make up the deficit, propionic acid was indicated, but to introduce the preformed acid would have created the danger of acidosis. Therefore, sodium propionate was administered to 25 cows. One failed to respond (she had metritis) and 3 relapsed. In all the others, blood sugar levels rose promptly, and the milk flow rose also. In most cases, the appetite was better within a day or two, but the ketone levels receded slowly to return to normal at about ten days.

The treatment consisted of dissolving 2 or 4 oz. of sodium propionate in water morning and evening and administering this for

ten days. This dissolves readily in 1 pt. of water. The calcium salt appears to be equally effective but dissolves more slowly. Either salt is inexpensive and should be available since both are used by bakers to reduce ropiness and prevent mold.

The value of feeding the propionate as a preventive is being studied.—L. H. Schultz, Ph. D., Cornell University.

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*Prevention of Enlarged Hock Disease in Turkeys and Ducks.*—This condition can be prevented and corrected by adding niacin and vitamin E to the ration. In ducks, adding niacin alone has been effective. Dried brewers' grains, at a level of 7.5 per cent of the ration, will prevent appearance of the disease, since it is a good source of niacin and also contains antioxidants which protect the vitamin E.—M. L. Scott, Ph. D., Cornell University.

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*Forage Preservation Affects Milk Production.*—More milk per acre is produced from forage preserved as barn-dried hay than from early silage, late silage, or field-cured hay.—K. L. Turk, Ph. D., Cornell University.

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### Field Observations on the Relation of Nutrition to Sterility in Dairy Cattle

Carotene, vitamin A, calcium, phosphorus, and iodine deficiencies did not contribute to sterility, while cobalt and copper deficiencies may have been a factor. This is the summary of results collected by a mobile laboratory which visited 28 herds containing 1,533 cows and heifers of breeding age in New York State.

Blood samples were obtained from 275 animals of breeding age (17.9%) on these farms. These included all cows having a history of breeding trouble and an equal number (by herds) of cows with a normal breeding history. The problem cows were divided into five groups: (1) four or more services without conception; (2) returned in heat two to five months after last service—abortion observed in about half; (3) absence of heat; (4) nymphomania; (5)

retained placenta, metritis, vaginal discharge, etc.

A reduced hemoglobin was noted in all anestrus cows, and all of the nymphomaniacs had cystic ovaries and a high plasma protein.—Wm. Hansel, Ph. D., Cornell University.

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#### What Is Known About the Function of Antibiotics

Many antibiotics have the property of promoting the growth of animals. Among these are aureomycin, bacitracin, penicillin, terramycin, and possibly others. The manner in which they function is not clearly understood but the following hypotheses have been advanced:

1) *Antibiotics stimulate the growth of animals* by a direct effect on body metabolism. This was an early belief based on work with penicillin and bacitracin and on the theory that the antibiotic molecule stimulated growth by functioning as a metabolite within the body. However, sterile antibiotics fed in sterile feed to germ-free chicks and poults caused a growth depression rather than a growth stimulation.

2) *Antibiotics prevent the growth of bacteria which produce enterotoxins* with a growth-retarding effect. This was a logical theory based on knowledge that large doses of antibiotics cured diseases and reduced the number of clostridial organisms in the intestinal tract but without evidence that the clostridial organisms normally present exert any detrimental effect upon animal growth.

3) *Antibiotics inhibit the development of bacteria that compete with the animal for essential nutrients in the feed or produced by bacterial synthesis.* Chickens raised in quarters where none have been reared previously grow as well as chickens from the same hatch and fed the same ration, except for the addition of antibiotics, but housed in quarters previously used for chicks. The fact that others from the same hatch, raised in the old quarters but not fed antibiotics, grow at a slower rate suggests that growth is depressed by an unrecognized infection—or by growth in the intestine of bacteria which compete for food substances (fed or synthesized).

4) *Antibiotics promote the growth of bacteria which synthesize essential nutrients.* There is ample evidence that vita-

mins are synthesized by the microflora—notably the B vitamins in the rumen and in the lower intestine of nonruminants. Some experiments show that these synthesizing bacteria can be stimulated by antibiotics.

5) *Antibiotics overstimulate the synthetic powers of some bacteria and thus produce abnormal quantities of essential nutrients.* This is a continuation of the preceding theory. Mutant strains of some bacteria seem to replace, in part, the need for antibiotics; or they enhance the antibiotic response. This sparing action is less noticeable as the ration approaches full adequacy.

6) *Antibiotics increase the ability of the animal to absorb essential nutrients.* There is evidence that this is true of the minerals (calcium, phosphorus, and manganese), probably by decreasing the pH of the contents of the small intestine, thus making the minerals more soluble. This would not affect minerals that are readily soluble nor the organic compounds.

*Summary.*—The evidence indicates that:

1) Antibiotics do not promote animal growth by direct effect on metabolism but may promote absorption of some minerals.

2) New, clean quarters may exert the same effect on growth as additions of antibiotics because of the presence, in the old quarters, of bacteria capable of producing disease, or of destroying essential nutrients, or of competing with the body for essential nutrients.

3) Antibiotics may promote the growth of bacteria which are able to synthesize essential food nutrients or to increase the synthesis of such substances.—L. C. Norris, Ph. D., Cornell University.

*Molybdenum and Copper Metabolism in Sheep.*—The nature of the ration can exert a very definite effect on the accumulation of copper in the liver of the sheep. Molybdenum exerts some influence on copper metabolism in herbivorous animals. Some rations limited liver storage of copper to 9 mg. while others permitted storage of 113 mg., although the intake of copper and molybdenum remained constant.—*Austral. Vet. J., Nov. 1, 1952.*

A cow needs 3 to 5 gallons of water daily for each gallon of milk she produces.—*Prairie Farmer.*



### Photosensitization

During the months of abundant sunshine, various animals may develop skin lesions, usually in the nonpigmented areas, if they are being fed various legumes, buckwheat, sudan grasses, or related species. When the sunburn lesions are observed, the animal should be removed from such pastures and kept out of the sunshine for at least one month or until the lesions are healed.

Various causes for this condition have been advanced. When on such green feed there is known to be an increased excretion of porphyrins, which are iron-free and magnesium-free pyrrole derivatives from hemoglobin and from chlorophyll, respectively. Porphyrins normally are excreted chiefly by the liver and it is possible that they may damage the liver, resulting in an increased concentration of porphyrins in the body. Then when the animal is subjected to strong sunlight or ultraviolet light, sunburn lesions develop. This may be because proteins in the skin undergo photooxidation or because some enzyme system is destroyed by photooxidation.—*Bull., Kansas V. M. A., Oct., 1952.*

*Urinary Porphyrin in Lead Poisoning.*—When chronic lead poisoning was produced in rabbits, their urine was found to contain increased amounts of porphyrin (a substance which is involved in photosensitization).—*Vet. Bull., Sept., 1952.*

### Dirt in Human Diet

Making sods available for baby pigs to chew on is a well-established and, apparently, a very beneficial custom. However, to learn that a parallel practice in women is found in rural Mississippi is astounding. Dirt-eating by pregnant women seems to be quite common there. Some also have an unaccountable craving for plain laundry starch. In a recent survey, all of the women who admitted dirt- and starch-eating were from the underprivileged group.

A dietary study of 361 pregnant women in one southern state revealed that 25 per cent included clay and 39 per cent included starch in their diet. They are quoted as saying: "I like the taste." "I eat dirt just the same way you smoke a cigarette." "When I get worried I eat more dirt. It seems to settle my stomach." "To kill

any germs I bake it in my oven." "I never heard of a man eating dirt. They not got the same taste women has."—*Vita-mineral News, Fall, 1952.*

### Working Collies

For three and one-half centuries, the real working Border Collie has been confined chiefly to southern Scotland because shepherds are reluctant to part with a good dog. These touselled, black and white dogs are more of a partner than a pet. They go with their masters everywhere, minding their own business. Before the turn of the century, when many cattle and sheep were being imported into the United States, quite a number of these exceptionally intelligent dogs were acquired in cinching deals. Few have been imported since.

In 1927, in order to focus attention on this intelligent, versatile breed, the annual New England sheep dog trials were started. Exhibitions are now put on before large crowds in many states. After seeing a sheep dog in action few would call the dog a dumb animal.—*Sheep Breeder, Nov., 1952.*

### Truth About Furs

On Aug. 9, 1952, the Fur Products Labeling Act went into effect. This marked the end of Hudson seal, which will now be called black dyed muskrat; marmink is now marmot; lapin, sealine, French seal, electric seal and sable dyed coney are now just rabbit. Most fur processors and retailing groups fought passage of the act. They argued that women were familiar with the trade names so there was no deception. Now the entire fur industry wholeheartedly approves of the change. Sales tags must disclose: whether the fur is dyed or otherwise changed from its natural state; if the fur contains less valuable parts of the animals; if the skins are imported; if used fur pieces are included.

The act will correct practices that have cast the stigma of "skin game" on the industry and will prevent camouflaging of furs from enemy countries.—*Fur News, Sept., 1952.*

Feeder cattle need a rest after a long trip.—*Prairie Farmer.*



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# EDITORIAL

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## The Research Council—Our Strong, Silent Partner

As the Research Council of the American Veterinary Medical Association commences its twelfth year of activity, the JOURNAL takes this opportunity to pay its respects. Charged with screening all manuscripts submitted to the *American Journal of Veterinary Research* and with instigating and supervising essential research, the Council for eleven years has given a maximum of service with a minimum of publicity. While anonymity is not one of their expressed aims, the members of the Council, when the scope of their responsibility is considered, more nearly earn that mark of unselfish distinction than perhaps any other active unit of the AVMA.

If curiosity were to suggest the question of just how the Research Council came into being and what its declared functions were, the answer could be found in the JOURNAL (Sept., 1940, and Oct., 1941). In the former (p. 204), the late Dr. Cassius Way, in his presidential address, said "Something will have to be done very soon to accommodate the large number of scientific articles which are being submitted for publication. Perhaps . . . we should consider . . . additional issues to take care of these papers." Because many of these manuscripts were very technical and of limited interest except to research workers, they were segregated and, in October, 1940, under the experienced hand of Dr. L. A. Merillat, then executive secretary and editor, a new publication came into being.

In the October, 1941, JOURNAL (p. 354), Dr. J. G. Hardenbergh, in his first report as executive secretary, said "The *American Journal of Veterinary Research*, launched . . . a year ago, . . . has a circulation of 1,868. By sponsoring it, our association has assumed a great and exacting responsibility to the . . . profession and to veterinary science." Also on page 349 of the same issue, the late Dr. H. W. Jakeman, former chairman of the Executive Board and the chief architect of the Research Council, in an unprecedented pre-presidential recommendation said, ". . . it would be de-

sirable to have a group of members, specialists in different fields, to review all articles before released for publication [in the A. J. V. R.]." They also considered it desirable "to set up a research council for this purpose . . . to avoid publication of any article which might contain highly controversial statements lacking sufficient scientific proof." Dr. Jakeman also recommended that, "In addition to editorial work . . . the council could plan and supervise a program for encouraging veterinary research."

Included in this recommendation was a list of 14 suggested nominees to represent 13 special fields in veterinary science, plus one member at large to represent Canada. The nominee list was the result of an extensive survey of the opinions of deans, heads of veterinary science departments, and others. The qualities designated, in addition to leadership in a special field, were "interest in AVMA affairs . . . and a broadminded attitude." A fourteenth specialty — poultry pathology — was added soon after the Council was activated.

The term of service for each member is three years with five members being appointed annually. These appointments are made by the Board of Governors and the executive secretary, with the approval of the Executive Board and the House of Representatives.

The Council held its first meeting in Chicago on Dec. 1, 1941. From its inception, it has found plenty to do editorially and has done it with marked efficiency, but its activities in supervising research were, for the first five years, limited by lack of the expected donations. Only one fellowship was awarded until 1946 when, with ample funds finally provided by a campaign among association members and donations from commercial sources, three others were granted. Since then, 18 more fellowships have been granted.

A full accounting on the Council membership and the research fellowship program was presented by Dr. M. A. Emmerson,

chairman of the Council, in the June, 1952, JOURNAL (pp. 341-358). However, that excellent report modestly takes no credit for, in fact makes no mention of, the principal, although less spectacular, functions of the individual members, i.e., their very essential contributions in an advisory editorial capacity. For that reason, we take this opportunity to give credit where credit is richly due and to express our profound appreciation of the unselfish services of these individuals.

The *Research Journal* now has a circulation of 3,700. That it has been eminently successful is attested to by the desire of many authors, some of whom are not veterinarians, to have their manuscripts published therein rather than in other scientific journals. Unfortunately, the workload of reviewing manuscripts is rather unevenly distributed among the Council members. It varies from year to year but, in 1952, of 125 manuscripts submitted to the *Research Journal*, more than 25 per cent were in the one field of bacteriology and immunology. Another 25 per cent were about equally divided between the two fields of virology and poultry pathology. A method for more equal distribution of manuscript reviewing should be found.

The species of livestock which would benefit most from the information in manuscripts which are published each year also will vary but in the four 1952 issues, 32 articles were concerned with cattle problems, 20 with swine, ten with horses, four with sheep and goats, 23 with poultry, 11 with small animals, and ten were general. The distribution of benefits to the various species from the investigations conducted to date by the 22 AVMA research fellows, according to Dr. Emmerson's report, would be: large animals — 10, small animals — 11, poultry — 3, and furbearing animals — possibly 10. Obviously many of these benefits overlap.

Recently, the question arose concerning who would hold the rights if any patentable discovery were made by a research fellow. A look at Dr. Jakeman's original recommendations gives the answer. In brief, it provides that at the Council's expense, the research fellow shall apply for the patent which will then be assigned to the Council which will, in turn, dedicate it to the best interests of the public.

One unique provision was made in setting

up the Research Council. It is that an award may be made "to a private practitioner for an article on original work or observations in some phase of clinical veterinary medicine." This provision apparently has been given little if any consideration. Perhaps a survey of field achievements of private practitioners might discover some worthy recipients and serve as a stimulus to greater efforts in that most important field of research.

### Myths and Facts About Actinomycosis

Actinomycosis has been recognized as a specific disease entity for nearly ninety years. About fifty years ago, it was indicated that more than one infective agent was involved and that more than one pathological condition resulted. However, only in the past twenty years has much progress been made in clarifying the confused thinking which had accumulated on the subject. Occasionally, current literature indicates that some of that confusion still exists.

Twenty years ago some authorities still considered the causative agent to be one of a variety of fungi which were supposed to exist as saprophytes on certain grasses and cereal plants, and that disease resulted only when these burrlike "ray fungi" entered the body tissues. They were supposed to be carried on plant fibers which entered through abrasions or on barley beards or other awns sharp enough to penetrate the tissues. It was even suggested, as a prophylactic measure, that certain awn-bearing grasses be exterminated. The disease was considered to be common in swine as well as in cattle, and to occur more rarely in horses, dogs, and man.

Since that time it has become generally recognized that two different infections, actinomycosis and actinobacillosis actually do exist in cattle. However, the types of infection which occur in other species is less well clarified. It has been established that in cattle the *true* actinomycosis occurs usually in bone tissue, most often the maxilla or mandible, and is caused by the *Actinomyces bovis* which occurs as a ray fungus.

The much more common soft tissue infections, called actinobacillosis, are usually caused by *Actinobacillus lignieresii*. These infections occur occasionally as "woody tongue" but much more frequently as cold abscesses usually in the region of the throat

and lower half of the head. They occur in all ages from calves to adults.

In swine, similar infections occur as cold abscesses in the throat region and occasionally as fibrous tumors in sows' udders. The latter, which are rarely seen in recent years, were formerly diagnosed as "botryomycosis" but now seem to be classified as true actinomycosis. The throat abscesses, which are apparently transferrable since there are usually many affected animals in an infected herd, may be caused by different organisms. Some may be actinobacillosis infections but clinically they are different. They are found independent of the disease in cattle and the abscesses, unlike those in cattle, rarely if ever develop proliferative fibrous capsules and when opened they usually heal readily. Although the pus is heavy, tenacious, and odorless, as in bovine actinobacillosis, the *Actinobacillus* organisms are usually not found. One typical outbreak was reported to be caused by a *Streptococcus* infection.<sup>1</sup>

While the disease is rare in dogs, this issue of the JOURNAL presents two articles in which one case was due to *A. bovis*, an anaërobe, while another was due to *Nocardia asteroides*, an aerobic organism. It is evident that the character of the disease in dogs is quite different from and much more serious than in other domestic quadrupeds. Also in this issue cases of apparent actinomycotic infections in a deer and in a horse are described.

True actinomycosis in cattle would seem to be less common than it was years ago, although we have no available statistics to prove it. This, if true, would be fortunate since it is a serious condition which has never yielded readily to treatment. However, treatment with antibiotics as reported by Kingman<sup>2</sup> may be more successful. On the other hand, bovine actinobacillosis continues to be very common and, contrary to previous opinion, seems to be quite readily transmitted within a herd. This is not true of the lingual form, since there is seldom if ever any discharge from the tongue lesions. The most remarkable feature regarding this woody tongue condition is the rapid response it usually makes to treatment with iodides. Animals gaunt and starving from

inability to eat usually are eating quite normally in a day or two after an intravenous injection of sodium iodide as suggested by Farquharson.<sup>3</sup>

Clinical evidence that actinobacillary abscesses are contagious was furnished by a herd (F. B.) in May, 1942. A cow at pasture developed a typical abscess. She was brought to the barnyard, the abscess "stabbed" and allowed to drain around a yard where 12 calves and yearlings were isolated. About a month later, 9 of the latter had to be treated for similar typical actino-abscesses. Another cattle feeder (W. M.) annually purchased up to 300 feeder calves directly from Wyoming ranches. They had access to a large, dark shed for shelter. For nine consecutive years, 1 to 12 typical cases were treated annually with 50 cases occurring in the last five of those years. When those quarters were abandoned for a new shed and feedlots, the infection disappeared. This latter herd was so typical that it became standard procedure to urge all clients to isolate such cases and to have them treated before an abscess could rupture and scatter the tenacious pus.

The standard treatment was to snub the animal in a stock, give an intravenous injection of sodium iodide (1 gr./lb.), then, after laying old sacks or straw around to catch the pus, incise all abscesses that fluctuated and thoroughly swab the cavities with tincture of iodine. Small abscesses were allowed to resorb. The intravenous solution was always made fresh so if several cases were to be treated, clean warm water in the farmer's wife's tea kettle was requisitioned. When the job was completed, sometimes as many as 12 cases in one lot, the pus-bearing straw or sacks were soaked with oil and burned, and the equipment including the stanchion was carefully cleaned and scrubbed. Abscesses in large bulls were usually not incised, unless they were about to rupture, since local treatment might have made the animal head-shy or dangerous. If the abscesses threatened to, or actually did, rupture, the bull often could be kept isolated.

The heavy dose of sodium iodide mentioned here seldom produced noticeable signs of iodism and in only 1 of hundreds of cases did it cause a noticeable reaction of

<sup>1</sup>Snocenybos, et al.: Abscesses Associated with Group E Streptococci. J.A.V.M.A., 110, (March, 1952): 134-137.

<sup>2</sup>Kingman, H. E., and Palen, J. S.: Streptomycin in the Treatment of Actinomycosis. J.A.V.M.A., 108, (Jan., 1951): 28-30.

<sup>3</sup>Farquharson, J.: Intravenous Use of Sodium Iodide in Actinomycosis. J.A.V.M.A., 91, (Nov., 1937): 551-554.

any kind. When treating pregnant cows, it was halved and if necessary the cow was re-treated after she calved.

Reports of the Meat Inspection Service of the Bureau of Animal Industry do not distinguish between actinomycosis and actinobacillosis but the total condemnation of parts or total carcasses has not varied much in the past thirty years. In 1924, of 9 million cattle slaughtered, 93,200 (1%) had parts condemned and 658 total carcasses were condemned. Similar figures for 1938 were 10 million with 220,948 (2.2%) parts and 1,089 carcasses condemned and in 1951, 12.6 million with 143,128 (1.1%) parts and 628 carcasses condemned.

[The JOURNAL would welcome a few case reports based on antibiotic or other treatment for actinomycotic conditions; also the findings of any laboratory on the infective agents found in the jowl abscesses of swine. —Ed.]

### Legislative Organization Being Developed

Letters have gone and are going out to members in almost every state asking them to assist in presenting the views and opinions of the AVMA to congressmen in the 83rd Congress. It is the objective to have a member who can present to each representative and senator, upon very short notice when necessary, the AVMA position in regard to legislation. These members are being kept abreast of legislation of interest to the profession and are informed as to what the Association is doing in regard to legislative matters.

In each state, a key person has been asked to serve as the state legislative liaison man. He, in turn, has helped select and organize the members within his state who will assist in this program. In emergencies, these state liaison men will be asked to contact all legislative representatives in their state. It is certain that such an organization will make it possible for the Congress to receive the views of the profession on all matters affecting it in a much clearer and more effective manner.

The earth's average population density is 47 persons per square mile.—*Sci. Newsletter*, Nov. 1, 1952.

### An Opinion on Livestock Auctions

After a 4,000-mile trip looking at livestock auctions throughout this country, talking to farmers, veterinarians, professional buyers, county agents, and state officials an observer states: "I saw many good auctions, others that are cesspools of disease and some that are just plain gyp-joints. These 'rotten apples' give a black eye to the whole livestock auction business. They steal—intentionally and unintentionally—and send diseases and parasites home with those who buy, yet we aren't doing very much about it."

These poorly run, dishonest livestock auctions developed because of the tremendous increase in such auctions in the past twenty years, with little or no regulation. State regulatory laws are either woefully weak or poorly enforced. The U. S. D. A. supervises the larger auctions, those with over 20,000 square feet of space but, because of lack of funds, is able to do only about half a job. The writer, therefore, appeals to the public to be on its guard in dealing with such auctions and to press for better auction laws in their states.

Among the suggestions made for the improvement of livestock auctions are the following: (1) license all auction owners, auctioneers, weighers, dealers, and commercial livestock truckers. It is easier to put shady operators out of business by cancelling a license than through a costly court action; (2) set up nonpolitical inspections for scales, records, disease, and sanitation and require identification of all animals sold for slaughter; (3) the veterinarian, in addition to vaccinating all the hogs not going direct to market and making sure that all cattle in the sale are double tested, must see all animals on the day of sale and keep the sick out of the auction; (4) the owner must be required to certify that his animals are not known to be diseased or exposed to communicable diseases.—*Farm J.*, Jan., 1953.

*Tar from Cigarette Smoke.*—Tar from cigarette smoke, when painted on the skin over a period of about a year, produced cancer in mice. Lung cancer has increased in man in the past forty years until it is now the most common internal cancer of the male sex. It is rare to find a case in a nonsmoker.—*Sci. Newsletter*, Nov. 22, 1952.

# CURRENT LITERATURE

## ABSTRACTS

### Postvaccination Hog Cholera Losses

Typically affected pigs from 16 herds that suffered heavy postvaccinal losses showed gross lesions of septicemia at autopsy. Blood and other tissues from these pigs were injected into (1) cholera-susceptible pigs, (2) cholera-susceptible pigs simultaneously receiving protective doses of hog cholera antiserum, and (3) pigs previously receiving hog cholera virus and antiserum. Some of the inoculums represented single herds, others were composites from several herds. The results revealed reasonable evidence of the presence of hog cholera virus in each inoculum. Two brands of commercial hog cholera virus and antiserum were used in cross-immunization pig inoculation tests. (Field use of one of the brands had been followed by considerable postvaccinal loss.) The results indicated that each of the antisera provided protection against each of the viruses. — [D. W. Pratt: *A Study of Postvaccinal (Hog Cholera) Losses*, *Am. J. Vet. Res.*, 13, (Oct., 1952): 526-530.]

### Normal Variances in Horse Blood

A clinical survey of the blood cytology and hemoglobin of 265 horses maintained in Cochabamba, Bolivia, was made and the results were as follows: Thoroughbreds were shown to have a higher red cell count than other breeds. Young foals and postpartum mares had a temporary polycythemia. Lactating and antepartum mares were anemic. Immature horses had higher leukocyte counts than adults. Eosinophils were most numerous in Thoroughbreds and lactating mares. Changes due to altitudes (8,375 ft.) alone were not significant. The results are compared to the work of others and a review of the literature on the blood of the horse is made. — [B. F. Trum: *Normal Variances in Horse Blood Due to Breed, Age, Lactation, Pregnancy, and Altitude*, *Am. J. Vet. Res.*, 13, (Oct., 1952): 514-519.]

### A Semen Study of Goats

Semen from 9 Toggenburg and 10 common American bucks was collected at four-week intervals for one to three years for different individuals. Observations included semen volume, motility score, concentration, total spermatozoa, and percentage of abnormal spermatozoa. Averages for all bucks for the total period observed were: semen volume, 0.650 cc.; motility, 1.51; concentration, 2.724 billion spermatozoa per cubic centi-

meter; total spermatozoa, 1.658 billion; percentage of abnormal spermatozoa, 8.46.

Analysis of variance showed the greatest source of variation was between bucks, followed by period of the year when collections were made. Year to year variance was unimportant. Semen characteristics were most favorable for successful breeding during the normal breeding season (August to January) and least favorable during the normal anestrus period of the does (February to July). Neck and midpiece abnormalities far exceeded all other types, amounting to more than 75 per cent of the total abnormalities present.

Highly significant negative correlations existed between volume and concentration, motility and percentage of abnormal spermatozoa, and volume and percentage of abnormal spermatozoa. Highly significant positive correlations were found between volume and total spermatozoa and concentration and total spermatozoa. Partial correlations of concentration and total sperm with volume constant, and volume and total sperm, and volume and abnormal sperm each with concentration constant, were also highly significant. Breed of the bucks, and to a certain extent age and weight, appear to influence various semen characteristics. The data for goats agreed closely with similar data for rams made at an earlier period. — [Orson N. Eaton and Victor L. Simmons: *A Semen Study of Goats*, *Am. J. Vet. Res.*, 13, (Oct., 1952): 537-544.]

### N-Heterocyclic Compounds and Horse Strongyles

In a study of the effect of 93 N-heterocyclic compounds on the developmental stages of horse strongyles in feces, it was found that 16 of 52 pyridine derivatives, five of 29 piperidine derivatives, and two indol derivatives were toxic at a concentration of 0.01 M. (molecular weight) or less. The most active compounds were 2-hexylpyridine, which killed the nematodes at a concentration of 0.00025 M., and nicotine sulfate, which did so at 0.00038 M. Other active compounds included chlorinated (approximately 4 Cl) 3-methylpyridine, mixed dipyrindyls from 2-methylpyridine, and N-n-dodecylpiperidine (0.0025 M.); 2-vinylpyridine, 2-vinyl-6-methylpyridine, the sulfates of dipyrindyls from 2-methylpyridine, and 1, 2-di(2'-pyridyl)ethane (0.005 M.); and 2-aminopyridine, chlorinated (approximately 5 Cl) 4-methylpyridine, the sulfates and acetates of dipyrindyls from pyridine, the acetates of dipyrindyls from 2-methylpyridine, sym-di-(2-pyridyl)thiourea, N-nitroso-2-methylpiperidine, N-n-hexadecyl-



N-ethyl-2-methylpiperidinium bromide, 4-methyl-phenyl- $\beta$ -piperidinoethyl ketone hydrochloride, 2-piperidinomethyl-4-methylcyclohexanone hydrochloride, N-vinylindole and 2,3-dimethylindole (0.01 M.).

Saturation of the pyridine ring of nicotine to form hexahydronicotine was accompanied by loss of anthelmintic activity. Caricide, which is active against filarids and ascarids, was inactive in this study.

Washed eggs and first and second stage larvae were killed by an emulsion of 0.01 M. of 2-hexylpyridine in 0.5 per cent triton NE, but washed third stage larvae were not markedly affected even after five days.—[N. D. Levine and Virginia Ivens: *The Effect of Some N-Heterocyclic Compounds on the Developmental Stages of Horse Strongyles*. *Am. J. Vet. Res.*, 13, (Oct., 1952): 520-525.]

#### Transmission of Q Fever Among Dairy Cattle

Many serologically positive cows eliminate *Coxiella burnetii* in their milk for prolonged periods and therefore represent a most constant source of infection. Hence, this experiment was conducted to determine whether dairy cattle could be infected through contamination of the teats with infectious milk. For approximately six months, 5 cows were exposed repeatedly by applications of infectious milk (containing 10 to 1,000 minimal infectious guinea pig doses/ml.) to their teats. Since all remained refractive to infection, they were then similarly exposed for four and one-half months to milk of 2 cows artificially infected with *C. burnetii* and *Streptococcus agalactiae*. Three of the 5 contracted streptococcal mastitis but again all remained refractive to infection with *C. burnetii*. It is unlikely that natural Q fever infection in cattle is acquired by entrance of rickettsias through the teat canal.—[Herbert G. Stoenner and David B. Lackman: *The Role of the Milking Process in the Intraherd Transmission of Q Fever Among Dairy Cattle*. *Am. J. Vet. Res.*, 13, (Oct., 1952): 458-465.]

#### Morphological Observations of Pseudorabies Virus (Aujeszky Strain)

Studies by electron microscopy of a concentrated virus-bearing brain suspension of rabbits infected with pseudorabies (Aujeszky strain) showed the virus to be somewhat spherical with a diameter between 90 and 100  $\mu$ . These bodies could not be demonstrated in concentrated normal rabbit brain subjected to the same procedure of concentration and examination. This concentrated infected material, upon being injected into normal rabbits intracerebrally, produced typical symptoms of pseudorabies. Virus suspensions from the

brains of these rabbits injected intradermally into other rabbits produced pruritus and death within seventy-two hours. The virus in the concentrated material was infectious for unvaccinated guinea pigs but had no effect on guinea pigs previously immunized against pseudorabies virus.—[Ronald L. Reagan, D. M. Schenck, M. P. Harmon, and A. L. Brueckner: *Morphological Observations by Electron Microscopy of Pseudorabies Virus (Aujeszky Strain) After Propagation in the Rabbit*. *Am. J. Vet. Res.*, 13, (Oct., 1952): 577-578.]

#### Experimental Infection of Sheep and Goats with *Dictyocaulus Filaria*

Experimental infection of lambs with the nematode lungworm, *Dictyocaulus filaria*, showed that the prepatent period ranged from thirty-two to fifty-seven days, and that the peak of larval output occurred thirty-nine to fifty-seven days after infection. Adult sheep not previously exposed to lungworm infection were much more resistant to these parasites than lambs. The principal symptoms of the infection were intermittent coughing, rapid shallow breathing, and loss of appetite and weight. Loss in weight usually occurred the fourth week after infection.—[Aron Goldberg: *Experimental Infection of Sheep and Goats with the Nematode Lungworm, Dictyocaulus Filaria*. *Am. J. Vet. Res.*, 13, (Oct., 1952): 531-536.]

#### Effects of Newcastle Disease Virus on the English Sparrow

Studies were made to assess the effects of intracranial and aerosol exposure of English sparrows with Newcastle disease virus and to assess the transmission of the virus from chickens to sparrows. The following results are interpreted to signify that the English sparrow (*Passer domesticus*) is susceptible to ND by intracranial or aerosol exposure and contact with infected sparrows but is unlikely to develop ND from exposure to infected chickens: (1) The virus was recovered from brain, liver, lung, kidney, spleen, blood, and intestinal contents of some sparrows following intracranial or aerosol exposures. Of a total of 176 materials tested, virus was recovered from 92 (53%). (2) Survival time of sparrows exposed by an aerosol method was almost twice as long as following intracranial inoculation. (3) Transmission of Newcastle disease from intracranially infected sparrows to cage mate controls occurred on three separate occasions. (4) Transmission of ND from chickens to sparrows under simulated natural conditions did not occur although the episode of disease in chickens caused a mortality of 90 per cent.—[D. P. Gustafson and H. E. Moses: *Some Effects of Newcastle Disease Virus on the English Sparrow*. *Am. J. Vet. Res.*, 13, (Oct., 1952): 566-571.]



## FOREIGN ABSTRACTS

### Influence of Aluminum Hydroxide on Immunity Produced by Foot-and-Mouth Disease Vaccine

Originally, the foot-and-mouth vaccine consisted of a 60-ml. dose containing 0.7 per cent virus and 50 per cent aluminum hydroxide. To test the value of smaller amounts containing more virus, four vaccines containing 0.8, 0.16, 3.2, and 6.4 per cent virus in 50 per cent aluminum hydroxide were each given to 40 cattle in doses of 15.0, 7.5, 3.8 and 1.9 ml., respectively. No difference in immunity could be detected when the animals were subsequently exposed. In a second experiment, five vaccines were prepared containing 1.0 per cent virus and 10, 30, 50, 70, and 90 per cent aluminum hydroxide, respectively. They were each given to 40 cattle in 15-ml. doses with the result that no difference in immunity could be detected.—[E. G. Fogedby, W. A. Malmquist, O. L. Osteen, and M. L. Johnson: *Influence of Various Amounts of Aluminum Hydroxide on the Immunity Produced by Foot-and-Mouth Disease Vaccine*. Nord. Vet.-med., 4, (Aug., 1952): 745-754.]—A.G.K.

### Food Poisoning of Mink

Botulism, type C, is the most common cause of food poisoning of mink in Sweden. It was diagnosed in 13 of 22 cases of food poisoning and the specific toxin was identified in 12 of the 13 instances. In 1951, a total of 45,000 mink on 60 farms were vaccinated with botulinum toxoid, type C. Food poisoning subsequently developed on only one farm where there were 10 cases among vaccinated animals and 30 among nonvaccinated controls.—[K.-E. Kull and K. Moberg: *The Frequency of Food Poisoning Due to Botulism in Mink in Sweden in 1951*. Nord. Vet.-med., 4, (Aug., 1952): 771-779.]—A.G.K.

### Serological, Cultural, and Antigenic Aspects of Pullorum Disease

Studies were made on 26 hens previously infected as chicks, and 10 hens from a normal flock permitted contact with the former. It was found that prior to egg-laying, the antibody titer is low but it increases after egg-production starts and persists even when the hens stop laying. Only 1 of the 10 healthy hens was serologically positive after five months' contact with the infected birds. During the experiment, 13 reactors laid 529 eggs of which 430 were cultured. *Salmonella pullorum* was isolated from the yolk of eight and from the shell of 13. Antigenic studies on 122 strains of *S. pullorum* and *Salmonella gallinarum* revealed that they were identical with respect to the factors IX, XII<sub>s</sub>, and XII<sub>h</sub>.—[H. E. Maribedal: *Studies*

*on Pullorum Disease. Serologic, Cultural and Antigenic Aspects*. Nord. Vet.-med., 4, (March, 1952.): 201-224.]—A.G.K.

### The Liver Fluke Problem and Its Control

A statistical survey extending from October, 1946, to June, 1947, made at the abattoir of Ghent revealed that of 12,382 animals 1,438 or about 11 per cent had their livers condemned on account of fluke infection. The damage inflicted, as well as the decrease of animal production caused by this parasite, demands an extensive campaign including pasture hygiene (the copper sulfate method) and especially anthelmintic treatment of the animals concerned. The treatment must be based on the precise knowledge of the varying periods of the development of the flukes.—[R. Vercruisse: *On the Liver Fluke Problem and Its Control*. Vlaams Diergeneesk. Tijdschr., 22, (June, 1952): 117-123.]—L.V.E.

### On the Inducement of Abortion in Cattle

The authors submit the following reasons for causing abortion in cattle by the use of stilbestrol:

1) To cause abortion in animals when bred too young and in animals kept for fattening. Of 31 animals treated, 19 aborted. By improving the technique (1, 2, or 3 injections of 500 to 1,000 mg. of stilbestrol every day), they expect to obtain abortion in more than 80 per cent of pregnant animals. The sensitivity to this treatment varies greatly from cow to cow. The period of pregnancy (2 to 7 months) plays an unimportant role in the results. A relaxation and evolution of the tissues of the genital tract and of the udder are the first symptoms, and abortion follows on the second to twentieth day after the first injections without any trouble for the cow. In some cases, the fetus appears to die soon after injection but is retained for some days longer in the uterus before it is expelled. In cases of afterbirth retention (7 cases), the animal may become seriously ill. Among 4 heifers that were bred after abortion, 3 became pregnant.

2) To induce calving in cases of prolonged gestation (10 to 12 months) and also in cases that seemed ready to, but did not, calve at about the normal time and in which regression and involution of the genital tract and of the udder took place. Among 16 such animals, 13 calved within two to five days after the first injection. The preparation of the genital tract and the udder for birth occurred so clearly and rapidly after treatment that the authors are convinced that stilbestrol can induce or hasten the calving in most cases of prolonged gestation when treatment is applied as indicated in the text. Lactation appears to be improved by the treatment.—[A. Van de Velde, J. Vanden Bergh, M. Vande Plasche, and V. Paredis: *On the Inducement of Abortion in Cattle*. Vlaams Diergeneesk. Tijdschr., 27, (May, 1952): 93-104.]—L.V.E.

## BOOKS AND REPORTS

## Fleas, Flukes, and Cuckoos

Miss Miriam Rothschild, of the famous family of merchant bankers, contributes from her knowledge as a zoologist. She, with Miss Theresa Clay, a zoologist of the British Museum, produced the book, "Fleas, Flukes, and Cuckoos"—a mass of interesting information, including how birds and some insects spread a wide variety of parasites over vast areas, some of which are a menace to both man and beast. The story is told of how a certain flea is associated with bubonic plague; a rove beetle that breeds only in a bird's nest where the temperature is above 40 C., and how a duck may eat a fluke and the latter become an internal parasite.

These investigators invaded the private life of the beautiful lady cuckoo and came up with the astounding story that she has much esthetic appeal but that she is nowise snobbish and will permit the romantic advances of every male cuckoo in the community without even the suggestion of a frown. Moreover, the female cuckoo is not a good mother for she deposits her eggs in the nests of many other species of birds, leaving these strange birds to become the foster parents of her young. Beyond this, she is prone to carry harmful parasites to the nests she invades and to pick up others to deposit elsewhere.

The female flea is equally promiscuous and, perhaps, one of the reasons for her risqué attitude is the fact that she is able to retain the male sperm indefinitely without it coming in contact with her ova, giving her time to think things over or even expel the sperm should her associates later be found unworthy of parenthood.

Scores of drawings and pictures illustrate many of the important parasites dealt with in the book, which will be found most interesting to all who realize the danger incident to the spread of disease-producing organisms. The amateur naturalist will find it a valuable addition to his library.—[*Fleas, Flukes, and Cuckoos*. By Miriam Rothschild and Theresa Clay. 304 pages. Illustrated. The Philosophical Library, Inc., New York 16, N. Y. 1952. Price, \$8.75.]—J. A. BARGER.

## Health Resources in the United States

This is an account of a study made by staff members of the Brookings Institution, with the collaboration of numerous other individuals and institutions. The study of three years was supported by a grant from the Maurice and Laura M. Falk Foundation of Pittsburgh.

The first part deals with human morbidity and mortality in the United States and the progress made since 1900. At the turn of the century, the total death rate in the United States was 17.2 per 1,000 population. For 1950, the comparable rate was 9.6. The average life span has increased from 49.2 years in 1900 to 67.2 years in 1948. The

death rate of children under 1 year of age declined from 162.4 per 1,000 live births in 1900 to 31.3 in 1949. Generally speaking, the infectious and communicable diseases have shown the greatest declines whereas the degenerative and other diseases have shown some increases, have remained constant, or have shown only slight decreases.

The reasons for improvement are many. Increasing knowledge of the infectious diseases, newer methods of disease control and prevention, a better knowledge of sanitation, better housing, campaigns against venereal diseases and tuberculosis, greatly improved diets as a result of the newer knowledge of nutrition, and a generally higher educational level of the people are some of the more important of these.

Advances in health have not been uniform throughout the country, or for different segments of the people. Heart disease, violent and accidental deaths, nephritis, tuberculosis, syphilis, and diseases of the digestive system are far more common causes of death in men than in women. On the other hand, diabetes is much more frequent in women than in men.

The total death rate in 1948 per 100,000 population was 956.8 in white males as against 1,275.9 in the nonwhite males. In white females the rate was 660.0 as against 1,011.2 in the nonwhites. The significant differential in the death rates between urban and rural populations in favor of the latter continues, although it is gradually becoming less. The differential between different parts of the country is very considerable.

Whereas in the 1940-1950 decade the number of physicians increased only 17 per cent, dentists 18 per cent, and professional nurses 18 per cent, there was an increase of 41 per cent in chiropractors and 76 per cent in osteopathic physicians. The auxiliary professions showed much greater increases, averaging 70 per cent. Physical therapists increased 84 per cent, radiology technicians 71 per cent, optometrists 71 per cent, and sanitary engineers 129 per cent. Veterinarians increased during this period by 43 per cent. Since there was a population increase of 14.5 per cent during this decade, it is obvious that the major medical professions did only a little better than hold their numerical relationship.

The remainder of the book deals with the character and growth of group practice, the health and hospitalization plans, the increase in hospitals, and the control campaigns against contagious diseases.

This volume is said to contain "the factual foundation for future Brookings studies in the field, which will offer analyses of a number of scientific and social problems relating to health." This statement describes the book. It contains a great deal of interesting and enlightening information—facts with little or no interpretations or conclusions. These evidently will come later.—[*Health Resources in the United States. Personnel, Facilities, and Services*. By George W. Bachman and Associates. 331 pages. The Brookings Institution, Washington, D. C. 1952. Price, \$5.00]—W. A. HAGAN.

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# THE NEWS

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## Ninetieth Annual Meeting of the AVMA

Toronto—July 20-23, 1953

*Record Attendance Expected—Early Hotel Reservations Advised*

**Women's Committee Appointed**

Predictions of record-breaking attendance are commonly used to stimulate interest and a desire to "be there" among prospective convention-goers, but there is ample justification for believing that the Ninetieth Annual AVMA Meeting in Toronto, July 20-23, 1953, will set a new registration record. That means a figure of about 3,200 or more, since the present record is 3,128 for the 1951 session in Milwaukee.

Factors that point to a big turn-out in Toronto include, naturally, a large attendance of Canadian veterinarians and their wives. (There are nearly 900 veterinarians in the provinces of

Ontario and Quebec alone.) Plans for a "homecoming" of Ontario Veterinary College alumni will not only attract these men in Canada but also the many O.V.C. alumni in the states. A larger than usual turn-out of veterinarians from the states is also expected because of the accessibility of Toronto to a large segment of the population from New England to the Midwest, a fact that is not fully realized unless one examines the map and sees the extent to which Ontario Province, in its relation to the Great Lakes region, dips down into the U.S.-Canadian border. A more favorable time, vacationwise,



Queen's Park and the Parliament Buildings of Ontario in Toronto.

for veterinarians and their families, the attractions of visiting another country with somewhat different customs even though such a close neighbor, and its lake and mountain regions for fishing and other vacation sports, all will undoubtedly have a marked effect on attendance at the Toronto convention.

#### LOCAL ARRANGEMENTS PROGRESSING

Starting last November, when the Committee on Local Arrangements was organized, steady progress has been made in a number of important details of the social program and entertainment plans. In addition, the Committee on Program is well advanced in its work; plans for the television demonstrations have been largely decided, including a check of facilities and requirements in Toronto by the co-sponsors, Pitman-Moore Company of Indianapolis and Radio Corporation of America. A preview of the scientific program will be given in the March issue of the JOURNAL.

#### WOMEN'S ACTIVITIES COMMITTEE APPOINTMENTS COMPLETED

To the roster of officers and chairmen of the Committee on Local Arrangements published in the January JOURNAL (p. 62), the following additional appointments to the Women's Activities Committee have been announced by the general chairman, Dr. E. R. Bowness:

#### Women's Activities

- Chairman*.—Mrs. Thomas W. Hawke, Coburg.  
*Secretary*.—Mrs. James A. Henderson, Guelph.  
*Reception and Tea*.—Mrs. Charles L. McGilvray and Mrs. Alan C. Secord, Toronto, co-chairmen.  
*Luncheon and Fashion Show*.—Mrs. Robert J. Pinkney, Cooksville.  
*Brunch*.—Mrs. John E. Leeson, Toronto.  
*Decorations*.—Mrs. Harold Worton, Peterborough.  
*Hospitality*.—Mrs. E. Rendle Bowness, Toronto, Mrs. T. Lloyd Jones, Guelph, and Mrs. J. A. Charlton, Toronto, co-chairmen.  
*Registration*.—Mrs. James A. Henderson, Guelph, and Mrs. Leslie W. Vercoe, Toronto, co-chairmen.  
*Teen-Agers*.—Mrs. H. Meldrum LeGard, Toronto.  
*Information*.—Mrs. J. J. Richardson, Toronto.

#### MAKE HOTEL RESERVATIONS NOW

The prospect of record attendance at the Ninetieth Annual Meeting emphasizes the desirability of making early requests for accommodations. See the hotel information and reservation blank on adv. page 49.

#### Dr. Brock Meets with State Representatives

The secretaries of the state associations in Executive Board District VIII (Texas, Arkansas, Louisiana, Kansas, Missouri, and Oklahoma) and the delegates and alternates to the AVMA House of Representatives from these states met with

Dr. W. G. Brock, Executive Board member from District VIII, in Oklahoma City on Jan. 11, 1953. This was the first meeting of this type held. The evaluation of it by those attending will determine whether similar meetings will be held in other Executive Board districts.

The subjects discussed at the winter meeting of the AVMA Executive Board were reviewed with the secretaries, delegates, and alternates. The opinions of the state representatives were solicited on several important matters.

It was the objective of the meeting to present to the representatives of the state associations a clearer picture of what the AVMA is doing and, in turn, receive from them suggestions and recommendations in regard to present and contemplated activities and programs.

#### New Officers of Veterinary Division, Land-Grant Colleges

During the November, 1952, meeting of the Association of Land-Grant Colleges and Universities in Washington, D. C., the Division of Veterinary Medicine of the association elected as its new officers, Dean I. A. Merchant of Iowa, as chairman; Dr. F. E. Hull of Kentucky, secretary; and Dr. A. H. Groth, Missouri, member of the executive committee, to succeed Dean W. A. Hagan of New York.

The 1953 meeting of the association will be held at Columbus, Ohio, November 10 to 12.

#### Dr. Krill Appeared Before Special Commission on Incentive Pay for Armed Services

Dr. W. R. Krill, representing the AVMA, appeared before a special commission of the Armed Services, which is studying incentive and hazardous duty, on Dec. 15, 1952, in Washington, D.C. The commission was appointed late in October and had already received a statement in regard to the inequity of excluding Veterinary Corps officers from the special pay given Medical Corps and Dental Corps officers (see Sept., 1952, JOURNAL, p. 166). Dr. Krill reiterated the arguments advanced in this statement and the points he made while testifying in this regard before the subcommittee of the Senate Armed Services Committee on April 17, 1952 (see June, 1952, JOURNAL, p. 406).

Dr. Krill is chairman of the AVMA Emergency Advisory Committee, Executive Board member from District X, and dean of the College of Veterinary Medicine at the Ohio State University.

The recommendations of the special commission are expected to have an important effect on the future of all incentive pay to personnel of the Armed Services. The AVMA is unequivocally opposed to the exclusion of Veterinary Corps officers from this equalization pay. The reasons for granting this additional pay to physicians and dentists on active duty with the Services are just as applicable to veterinarians in the Service. This

has now been clearly presented to the Senate Armed Services Committee, the special commission, and to numerous congressmen. The AVMA will continue to press for the addition of Veterinary Corps officers to those eligible to receive this equalization pay.

#### The Ralston Purina Company Research Fellowship Award

The Research Fellowship Award Program of the Ralston Purina Company will continue for the 1953-1954 school year. Its purpose is to train leaders in the scientific fields of livestock and poultry production. Awards are made on an annual basis but may be extended to three years. Seven research fellowships may be awarded annually, two each in dairy husbandry, animal husbandry, poultry husbandry, and one in veterinary science. The program is handled by a committee from five interested associations. Dr. M. A. Emerson of the Division of Veterinary Medicine, Iowa State College, represents the American Veterinary Medical Association. Application blanks may be obtained by writing to the Ralston Purina Research Award Committee, c/o Mr. J. D. Sykes, Ralston Purina Co., St. Louis 2, Mo. The applications and other requested information must be in the hands of the committee by March 1, 1953.

#### Veterinarians Participate in Civil Defense Conference

The Third County Medical Societies Civil Defense Conference, a volunteer organization of medical personnel charged with civil defense responsibilities, was held in Kansas City, Mo., on Dec. 13-14, 1952. The program and exhibits were all presented in the Municipal Auditorium. The meal functions were held in the President Hotel. Official hosts for the conference were the Jackson County Medical Society and Kansas City Civil Defense Department.

Veterinarians representing Chicago, St. Louis, Omaha, the National Association of Federal Veterinarians, the Federal Civil Defense Administration, and the AVMA attended all sessions. Other local veterinarians attended part of the conference.

This is the second conference in which veterinarians participated. Other "health" professions were also represented at the meeting and on the local committee. Dr. F. A. Todd of FCDA and Dr. C. D. Van Houweling of the AVMA were the official consultants representing veterinary medicine. Dr. K. M. Curtis of Kansas City, Kan., represented the profession on the Local Committee on Arrangements. Other veterinarians attending were: Dr. Thomas M. Eagle, Kansas City, Mo.; Dr. V. W. Gesellchen,



—Polytechnic Touring Assn., Ltd.

St. Mark's Place in Venice. This is one of the attractions included in the tours to be taken in connection with the Fifteenth International Veterinary Congress in Stockholm, Aug. 9-15, 1953.



Omaha, Neb.; Dr. Robert C. Glover, Evanston, Ill.; Dr. L. T. Hopkins and Dr. Fred B. Ogilvie, Kansas City, Kan.; Dr. Harry S. Richards, St. Louis, Mo.

The following statement was adopted by the veterinarians at the conference.

### Report of Section on Veterinary Medicine

I) The primary Civil Defense responsibility of veterinarians is to safeguard the animal food supply of our nation including the protection of food producing animals against biological warfare and natural disease epizootics. Secondly, veterinarians in the urban areas have a civil defense responsibility to assist other medical professions in the care and treatment of human casualties immediately following bombings or other attacks on our cities.

II) Activation and participation of veterinarians in civil defense programs in target areas.

#### RECOMMENDATIONS

1) That the medical civil defense leaders in the target areas be advised as to who are the veterinary medical leaders in the target areas so that active cooperation between the two groups can be developed.

2) That this Conference and the AVMA further this development by directing correspondence to these leaders urging their active cooperation and the integration of the veterinarians.

3) We firmly believe that to develop this cooperation to the maximum extent that there will have to be adequate representation of the veterinary medical profession at all levels in the planning and organization for medical civil defense.

III) Civil Defense classifications of veterinarians.

#### RECOMMENDATIONS

1) For civil defense purposes all veterinarians should be classified as to their professional work and specialties. The data accumulated by the National Scientific Register in regard to the professional classification of veterinarians can be utilized and is available to all organizations developing a local classification of the veterinarians.

IV) Responsibilities of small animal practitioners in target and other urban areas.

1) The Emergency Advisory Committee of the AVMA is developing a statement defining these responsibilities which will be published shortly in the JOURNAL of the AVMA and a copy of which will be supplied to this conference.

V) We endorse in principle the organization of a North American Medical Health Civil Defense Association. We believe that the organization should provide for proportionate representation of all of the health professions. We urge that serious consideration be given to organizing as a federation of city and county professional and health organizations with dues being paid by these local associations, although not excluding individual members.

VI) A bibliography of the best material written on veterinary medical civil defense will be submitted for inclusion in the proceedings of this conference.

S/K. M. CURTIS

### Second Report on AVMA Research Fund-Raising Campaign Shows 63 per cent Gain in Seven Weeks

Since the first report on the 1952-1953 AVMA Research Fund-Raising Campaign (see Jan., 1953, JOURNAL: 63), 968 veterinarians have made individual contributions totaling \$14,270.00, an average of \$14.74 per contribution. Veterinary associa-

tions, women's auxiliaries, and commercial companies added \$5,130.00 to the fund, making a grand total of \$19,400.00 as of December 22, 1952.

The healthy gain can be attributed directly to

### Second Report on 1952-1953 AVMA Research Fund Campaign (Prepared Dec. 22, 1952)

State	Total veterinarians (1952)	Quota*	Contributions received (to date)	Total amount contributed (to date)
Alabama	226	\$2,260.00	9	\$ 120.00
Arizona	71	710.00	5	70.00
Arkansas	69	690.00	5	55.00
California	1,352	13,520.00	58	755.00
Colorado	210	2,100.00	10	201.00
Connecticut	138	1,380.00	18	305.00
Delaware	42	420.00	5	75.00
District of Columbia	73	730.00	31	310.00
Florida	300	3,000.00	18	415.00
Georgia	280	2,800.00	10	137.00
Idaho	88	880.00	6	45.00
Illinois	800	8,000.00	78	1,265.50
Indiana	580	5,800.00	26	368.00
Iowa	814	8,140.00	48	595.00
Kansas	375	3,750.00	21	235.00
Kentucky	245	2,450.00	14	217.50
Louisiana	145	1,450.00	3	30.00
Maine	73	730.00	3	27.00
Maryland	149	1,490.00	19	300.00
Massachusetts	300	3,000.00	13	205.00
Michigan	623	6,230.00	47	555.00
Minnesota	525	5,250.00	34	438.00
Mississippi	128	1,280.00	5	35.00
Missouri	460	4,600.00	34	365.00
Montana	93	930.00	6	65.00
Nebraska	330	3,300.00	14	200.00
Nevada	30	300.00	1	10.00
New Hampshire	55	550.00	1	10.00
New Jersey	346	3,460.00	39	526.00
New Mexico	46	460.00	6	55.00
New York	1,161	11,161.00	68	1,217.00
North Carolina	207	2,070.00	20	325.00
North Dakota	70	700.00	3	30.00
Ohio	940	9,400.00	59	636.00
Oklahoma	220	2,220.00	9	117.50
Oregon	198	1,980.00	11	155.00
Pennsylvania	640	6,400.00	49	1,112.00
Rhode Island	28	280.00	1	25.00
South Carolina	110	1,100.00	3	25.00
South Dakota	119	1,190.00	7	101.00
Tennessee	168	1,680.00	5	292.50
Texas	875	8,750.00	21	325.00
Utah	68	680.00	5	140.00
Vermont	74	740.00	2	40.00
Virginia	180	1,180.00	10	249.50
Washington	314	3,140.00	22	357.00
West Virginia	78	780.00	3	50.00
Wisconsin	664	6,640.00	45	560.50
Wyoming	55	550.00	5	60.00
Hawaii	21	210.00	5	80.00
Canada	—	—	27	347.00
Foreign	—	—	1	10.00
<b>Totals</b>	<b>15,136</b>	<b>\$151,360.00</b>	<b>968</b>	<b>\$14,270.00</b>

#### Other Contributions

Veterinary Associations	\$1,160.00
Women's Auxiliaries	445.00
Commercial Companies	3,525.00
<b>Total</b>	<b>\$ 5,130.00</b>

Total contributions from all sources \$19,400.00

\*Based on an average contribution of \$10 per veterinarian.



the second letter which was mailed to all AVMA members and nonmember veterinarians on Oct. 29, 1952. Although a number of contributions were received from nonmembers, almost all donations came from AVMA members.

This second report differs from the first in that the total contributions for each state do not include sums given by women's auxiliaries and veterinary associations in the state. It is felt that by eliminating group donations, a more accurate picture is obtained of the contributions from individuals, and the average contributed per veterinarian.

Grateful acknowledgment is made to the following organizations which have contributed a combined total of \$5,130.00:

#### *Veterinary Associations*

Central California Veterinary Medical Association  
Central Minnesota Veterinary Association  
Eastern Iowa Veterinary Medical Association  
Georgia Veterinary Medical Association  
Interstate Veterinary Medical Association  
National Association of Federal Veterinarians  
Northern Illinois Veterinary Medical Association  
Orange County (California) Veterinary Medical Association  
Southeastern Michigan Veterinary Medical Association  
Southern Veterinary Medical Association  
Vermont Veterinary Medical Association  
Women's Veterinary Medical Association  
Wyoming Veterinary Medical Association

#### *Women's Auxiliaries to the*

Arkansas State V.M.A.	Mississippi Valley V.M.A.
California State V.M.A.	Northern Illinois V.M.A.
Central California V.M.A.	Northwestern Indiana V.M.A.
Florida State V.M.A.	Ontario V.M.A.
Illinois State V.M.A.	Southeastern Michigan V.M.A.
Iowa State V.M.A.	Texas State V.M.A.
Iowa State College Student Chapter	Utah State V.M.A.
Maine State V.M.A.	West Virginia V.M.A.
Maryland State V.M.A.	Wisconsin State V.M.A.
Michigan V.M.A.	

#### *Commercial Companies and Related Groups*

Allied Laboratories  
American Veterinary Exhibitors Association  
Curts-Folse Laboratories  
Haver-Glover Laboratories  
Martin Laboratories

### **World Conference on Fertility and Sterility to Be Held in New York**

The International Fertility Association announces that its first world conference on fertility and sterility will be held at the Henry Hudson Hotel in New York City, May 25-31, 1953. It will cover the entire field of fertility,

sterility, and artificial insemination. Sessions will be conducted in English, French, and Spanish with simultaneous translations, as used in United Nations meetings. It is expected that 1,800 scientists from 51 countries will attend. Those who plan to attend should write at once to the chairman, Local Arrangements Committee, 11-65th Avenue, New York 29, N. Y., for advanced registration.

## **STUDENT CHAPTER ACTIVITIES**

**Minnesota Chapter.**—The University of Minnesota Student Chapter of the AVMA held a smoker on Oct. 3, 1952, at which time the faculty members and new students were introduced.

The annual student-faculty Christmas party was held December 7. Refreshments were served after the program.

Regular meetings of the Chapter are scheduled for the first Wednesday of each month.

S/LYLE KANSANBACK, *Corresponding Secretary*

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**Missouri Chapter.**—The University of Missouri Student Chapter of the AVMA held its annual Christmas dance on Dec. 13, 1952. It was well attended by both faculty and students.

At the December business meeting, chapter members saw a motion picture produced by the Missouri Conservation Commission, "Bobwhite Through the Year."

The Chapter acted as host to the Knife and Needle Club, which is the pre-veterinary club at the University, and gave them a tour of the veterinary clinic. After the tour, motion pictures taken by members of the Missouri veterinary faculty of clinic subjects were shown, and the evening was completed with the serving of refreshments.

S/JOHN P. HICKON, *Secretary*

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**Washington Chapter.**—At a meeting of the Washington State College Student Chapter of the AVMA on Oct. 21, 1952, Dr. Marvin R. Hales, Division of Dairy and Livestock of the State of Washington, spoke on the activities of the Division of Dairy and Livestock. Also, the motion pictures "Necropsy of an Elephant" and "Ergot Poisoning" were shown.

On November 18, Dr. E. C. Stone, dean of the College of Veterinary Medicine, presented the Borden Award to Charles Reed, and the Washington State Horse Breeders Award to Dennis Waldron. The Borden Award is presented each year to the senior student with the highest scholastic record for the first three years of veterinary college. The Washington State Horse Breeders Award is given each year to the sophomore student with the best scholastic record for the freshman year. The motion pictures "Sheep Scab" and "Administra-

tion of Medicines to Sheep" were shown to complete the program.

**Dr. Phillip M. Hinze**, associated with Carnation Milk Farms, spoke on "Sterility and Reproduction Problems of Cattle" at a meeting on December 2. The motion pictures "Gastric Fistula Technique and the Interior of the Bovine Stomach" and "Swine Surgery" were shown.

S/ROBERT KING, *Publicity Chairman.*

## WOMEN'S AUXILIARY

### The Link Between the Women's Auxiliary to the AVMA and the Local Auxiliaries.—

The immediate link between the AVMA Women's Auxiliary and the local auxiliaries is that of affiliation. The word "affiliation" has various meanings in our dictionaries, but when we go back to its Latin root, we find that in our modern phrasing it can be described as "working together as a family."

A happy family works well together and, although each member goes about his or her own business, there is a strong feeling of interest and kinship with the parent and a sense of pride in what the family is accomplishing. The members of a happy family have a voice in family affairs, and they in turn look to the parent for kindly guidance. If help is needed, the members of a closely knit family see that it is forthcoming. At the same time, they realize that their own business is of primary importance, and that they can help only insofar as they are able.

The Women's Auxiliary to the AVMA, with its affiliated auxiliaries, is a happy family, and when we examine the above paragraph in terms of our AVMA Auxiliary, we can readily see that the attributes described do exist, and that there is a very strong bond between the AVMA Auxiliary and its affiliates.

The affiliated auxiliaries have a voice in the family affairs. Every affiliated auxiliary has the privilege of sending a representative to the AVMA Auxiliary House of Representatives, thus giving the voice of the auxiliary which she represents to the affairs of the Women's Auxiliary to the AVMA. The representative of each affiliated auxiliary is a very important person, indeed. She brings fresh ideas to the meeting and shares them with other members. She, in turn, absorbs new ideas to carry back to her local auxiliary. She has the power of voting on all business which affects the AVMA Auxiliary, and so plays a strategic part in its general growth and accomplishment.

The AVMA Auxiliary, in its turn, renders help and advice wherever it is needed. Many local auxiliaries have their constitutions based on that of the Women's Auxiliary to the AVMA. As the organization grows, and as plans are carried through, the AVMA Auxiliary will be of even

greater help . . . with ideas for programs, for meetings, for films to be used, for radio talks . . . . The AVMA is cooperating with us now in sending out news releases to the hometown papers of delegates and officers of the Auxiliary. Through the AVMA Public Relations Department, state and provincial auxiliaries, as well as regional, are now able to work with their associations in arranging for broadcasts over local radio stations. Auxiliaries interested in this program should first obtain the support of their association; they should then correspond directly with Mr. R. G. Rongren of the AVMA central office staff in Chicago.

"If help is needed, the members of a closely knit family see that it is forthcoming." This has been clearly demonstrated in the response from our local auxiliaries in their help in raising money for the Research Fund. Many affiliated auxiliaries have given donations, as their finances dictated—some large, some small—but large or small, they were all given with the same spirit of cooperation and with the strong desire to help. Many have contributed to our Student Loan Fund—much appreciated and much needed contributions to a fund that is active and important. The seniors we help are students of whom we can be proud.

We are grateful to our affiliated auxiliaries for their timely help, and feel that it is concrete evidence of their interest and a constructive addition to their existing projects.

I take this opportunity to thank the following affiliated auxiliaries for having contributed to the Student Loan Fund: the Women's Auxiliary to the Eastern Illinois V.M.A., the Women's Auxiliary to the Mississippi Valley V.M.A., the Women's Auxiliary to the Tennessee V.M.A., and the Women's Auxiliary to the West Virginia V.M.A. The Women's Veterinary Medical Association has also graciously contributed to this fund.

S/(MRS. H. S.) HAZEL MACDONALD, *President.*

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**New Mexico Auxiliary.**—The Women's Auxiliary to the New Mexico Veterinary Medical Association held its annual meeting at the La Caverna Hotel, Carlsbad, on Oct. 6, 1952. Following the luncheon, the business meeting was held and the following officers were elected: Mrs. Lester E. Patton, Albuquerque, president; Mrs. Sam Weist, Santa Fe, vice-president; and Mrs. Joe M. Miller, Alamogordo, secretary-treasurer. The following guests attended the meeting: Mrs. Charles Davis and her sister, Mrs. McGraff, both of Denver, Colo.; Mrs. Truman Jones, also of Denver; and Mrs. E. M. Baldwin of Omaha, Neb.

A full evening of dancing was provided for the group after veterinarians and their wives enjoyed the dinner at the Crawford Hotel Ballroom where Dr. Charles Davis, Denver, was a most delightful master of ceremonies.

A memorable climax to the session was a trip through the Carlsbad Caverns.

S/(MRS. JOE M.) MARGARET MILLER, *Secretary*.

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**Kansas City Auxiliary.**—The Women's Auxiliary to the Kansas City Veterinary Medical Association met December 16 at the Hotel Continental for their annual Christmas meeting and party. The president, Mrs. Earl Mundell, presided at the business meeting.

The following officers were elected: Mrs. Glen Dunlap, Kansas City, Mo., president; Mrs. E. L. Montgomery, Belton, Mo., vice-president; Mrs. K. M. Curtis, Kansas City, Mo., recording secretary; Mrs. W. H. Mowder, Independence, Mo., corresponding secretary; and Mrs. F. O. Cox, Holton, Kan., treasurer.

Mrs. Gladys Shaw, of the Floral Industries of Kansas City, gave an enjoyable demonstration of floral arrangement for the holiday season. She presented corsages to the president, Mrs. Mundell, and to the one who traveled farthest to the meeting, Mrs. F. O. Cox, of Holton, Kan.

A social hour followed during which gifts were exchanged and refreshments were served. The hostesses were Mrs. Glen Dunlap, Mrs. K. M. Curtis, and Mrs. Earl Mundell.

S/MRS. W. H. MOWDER, *Corresponding Secretary*.

## APPLICATIONS

### Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative By-Laws.

LANE, JAMES D.  
829 Allen Ave., St. Paul 7, Minn.  
D.V.M., Iowa State College, 1943.  
ROSZEK, KAZIMIERZ S.  
P.O. Box 578, Bathurst, N.B., Canada.  
B.V.Sc., Veterinary College Lwow, 1936.  
SCHMIDT, RAYMOND L.  
3217 E. 30th Terrace, Kansas City 3, Mo.  
D.V.M., Ontario Veterinary College, 1931.

### Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive

months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

### First Listing

DIPLOCK, PETER T.  
55 Clifford Rd., Eltham, New Zealand, 1952.  
B.V. Sc., University of Sydney, 1952.  
Vouchers: J. D. Steel and D. J. Smith.  
VELASQUEZ, JOSE, Q.  
Calle 15 #8-94, Bogota, Columbia, S. A.  
V.M., National School of Veterinary Medicine, 1925.  
Vouchers: H. Almanza and J. A. Villamil.

### Second Listing

de ARAUJO, ALOYSIO, Escola Superior de Agricultura Areias, Estado da Paraila, Brazil.  
VANNIASSINGHAM, JOHN A., 9 Pengkalen Rama Road, Malacca-Malaya, South East Asia.

### 1952 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (\*) after the name of a school indicates that all of this year's graduates have made application for membership.

### First Listing

#### Colorado A. & M. College\*

FOLAND, HARVEY C., D.V.M.  
Greenbrier Animal Hospital, Lewisburg, W. Va.  
Vouchers: R. W. Davis and H. P. Buckley.

## U. S. GOVERNMENT

**Veterinary Personnel Changes.**—The following changes in the force of veterinarians in the U. S. Bureau of Animal Industry are reported as of Dec. 5, 1952:

### NEW APPOINTMENTS

Salvatore Corridore, South St. Joseph, Mo.  
Moral R. Osborn, Fort Worth, Texas.

### CANCELLATION

Robert L. Mercer, Sacramento, Calif.

### RETURN FROM MILITARY FURLOUGH

Carl V. Simmons, Jr., Springfield, Ill.

### RESIGNED FROM MILITARY FURLOUGH

John J. Garvey, Augusta, Maine.

### RESIGNATIONS

Owen D. Baker, Helena, Mont.  
Ross E. Evans, Jacksonville, Fla.  
Wilbur C. Smith, Ottumwa, Iowa.

### TERMINATION

I. Newton Habecker, Springfield, Ill.

## RETIREMENTS

John M. Bowman, Boise, Idaho.  
Robustiano B. Ferro, Memphis, Tenn.  
Paul E. Nulk, Harrisburg, Pa.  
Glenn H. Randall, Sioux Falls, S. Dak.  
George B. Senior, Des Moines, Iowa.

## TRANSFERS

Beck B. Bowen, from Fort Dodge, Iowa, to South St. Joseph, Mo.  
Russell B. Briney, from South St. Joseph, Mo., to Kansas City, Kan.  
Jerry J. Callis, from Beltsville, Md., to Edgewood, Md.  
John B. Champlin, from Jefferson City, Mo., to Phoenix, Ariz.  
Wallford J. Johnson, from South St. Paul, Minn., to Salt Lake City, Utah.  
David O. Manley, from Cheyenne, Wyo., to Bismarck, N. Dak.  
Haldor T. Mydland, from Indianapolis, Ind., to Sioux City, Iowa.  
Louie E. Porch, from Ottumwa, Iowa, to Memphis, Tenn.  
Jennings B. Sigrist, from Salt Lake City, Utah, to Sioux Falls, S. Dak.  
Earl W. Stapp, from Amarillo, Texas, to Birmingham, Ala.

## AMONG THE STATES AND PROVINCES

### Arizona

**State Association Officers.**—The following officers were elected at the annual meeting of the Arizona Veterinary Medical Association in Chandler on Dec. 4-6, 1952: Drs. Donald L. Fox, Phoenix, president; R. W. Adami, Tucson, vice-president; J. R. Carney, Chandler, secretary-treasurer. The following were elected to the executive board: Drs. E. R. Hinshaw, Buckeye; J. L. Hinds, Tucson; and Wm. E. Snodgrass, Glendale.

S/Wm. E. SNOGRASS, *Resident Secretary.*

### Arkansas

**Resolution Passed Against Training of Laymen for Brucellosis Testing.**—The following resolution was adopted by a unanimous vote of the Arkansas Veterinary Practitioners' Association at their meeting in Hot Springs on Oct. 19, 1952.

#### RESOLUTION

WHEREAS, it has come to the attention of the Arkansas Veterinary Practitioners' Association that the Bureau of Animal Industry is now training laymen to draw blood samples for brucellosis testing in the State of Arkansas; and

WHEREAS, laymen have no concept of the overall aspect of brucellosis control and as "blood sample takers" would not be able to evaluate the problems of individual herds or to advise the herd owners as to the most practical approach to their specific problems, leading to inefficiency and waste of valuable livestock in the control program and dissatisfaction of the participating cattle owners. Dissatisfaction would naturally lead to the loss of participants in the program and the concurrent loss of any

gains toward control in the herds. Laymen, not cognizant of the modes of transmission of the various animal diseases, could very easily, through unsatisfactory practice, spread rather than control animal disease. For example, anaplasmosis is easily transmitted from animal to animal by bleeding needles. Laymen, through ignorance, are liable to be disseminators of this disease, especially since supervision over them can only be minimal. Wages currently paid lay help are not sufficient to draw individuals of high personal ethics required for such responsible positions.

WHEREAS, less than one-tenth of all the land in Arkansas is no more than 25 miles from a graduate veterinarian, it is obvious that few federal- or state-paid veterinarians, much less laymen, are needed if the control agencies utilize the ability and knowledge of the graduate practitioner.

WHEREAS, the tendency on the part of the Bureau of Animal Industry and others to offer free services, at public expense, where such services are not needed is a step toward socialism and the elimination of free enterprise. And

WHEREAS, the performance of the duties contemplated for "lay bleeders" would be in violation of the State Veterinary Practice Act,

NOW, THEREFORE, BE IT RESOLVED by the Arkansas Veterinary Practitioners' Association in regular meeting assembled at Hot Springs, Ark., Oct. 19, 1952, that this association go on record as: being willing to cooperate 100 per cent with any control program proposed for the benefit of the livestock industry in Arkansas and the people of Arkansas generally; being strongly against the "lay bleeders" program being sponsored by the Bureau of Animal Industry in the State of Arkansas and others.

S/GEORGE T. DUGAN, *President,*

Arkansas Veterinary Practitioners' Association  
S/WILLIAM L. THOMAS, *Secretary-Treasurer,*  
Arkansas Veterinary Practitioners' Association

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**Dr. Kerns Appointed Director of Veterinary Medical Division.**—Dr. Robert L. Kerns (D.V.M., COL '42; M.P.H., MIN '52) has been appointed director of the Division of Veterinary Medicine of the Arkansas State Board of Health.

Dr. Kerns previously served from 1942 to 1947 in the U. S. Army, from which he was discharged as major, V.C. (Reserve). The majority of his time overseas was spent as veterinarian of the Eighty-Second Airborne Division. From 1948 to November, 1950, he was employed as meat sanitation supervisor of the health department of the city of Milwaukee. From December, 1950, to July, 1951, he served in Japan as a U. S. Army veterinary civilian consultant with the Civil Affairs Team at Hokkaido.

His work with the Arkansas State Health Department will consist of: promotion activities to eradicate animal diseases transmissible to man; consultation and liaison with voluntary or official

agencies on matters regarding veterinary public health; development of animal morbidity reporting; and supervision of hygiene and inspection of all foods of animal origin. Dr. Kern's principal interests lie in the field of zoonoses.

### California

**Bay Counties Association Officers.**—At the annual business meeting of the Bay Counties Veterinary Medical Association held in San Francisco on Nov. 12, 1952, the following officers were selected for the ensuing year: Drs. Howard F. Carroll, San Francisco, president; Richard L. Stowe, San Francisco, vice-president; and David E. Madsen, San Jose, secretary-treasurer.

S/DAVID E. MADSEN, *Secretary.*

### Colorado

**State Association to Publish the Rocky Mountain Veterinarian.**—The Colorado Veterinary Medical Association recently announced plans to change the name of the *Colorado Bulletin* to *The Rocky Mountain Veterinarian*. It was to be published, starting in January, 1953, by the Colorado Veterinary Medical Association for all veterinarians in the Rocky Mountain region, i.e., Nevada, Idaho, Arizona, Utah, Montana, Wyoming, Colorado, New Mexico, and western Nebraska. In addition, copies will be sent to many former graduates of Colorado A. & M. College now practicing outside of this area.

### Connecticut

**Fairfield County Association.**—At the regular annual meeting of the Fairfield County Veterinary Medical Association held at Cobbs Mill Inn, Weston, on Dec. 10, 1952, the following officers were elected: Drs. Russell F. Strasburger, Newton, president; Howard Raven, Bridgeport, president-elect; and William R. Leggett, Westport, secretary-treasurer. The following were elected to the executive committee: Drs. Robert A. Rands, Stamford; Russell F. Strasburger; Howard Raven; William R. Leggett; Walter B. Holcomb, Danbury; John H. Nickerson, Stamford; and Maurice H. Ryan, Stamford.

The following men comprise the committee on ethics: Drs. Edward J. Burke, Greens Farms; George G. Pickett, Stratford; Robert A. Rands, Stamford; Edward D. Lubin, Danbury; and George H. Alfson, Norwalk.

S/ WILLIAM R. LEGGETT, *Secretary.*

### Delaware

**State Association.**—The annual meeting of the Delaware Veterinary Medical Association was held at the LePores Restaurant in Dover on Dec. 11, 1952. The following speakers comprised the program: Drs. J. C. Kakavas, University of Delaware; C. A. Turner, U. S. BAI, Baltimore; L. Manogue, Seaford; G. G. Rosenberger, Wilmington; and W. C. Fetheroff, Centerville.

At the business meeting, the Association voted to accept the news letter prepared by the State Diagnostic Laboratory as its official publication and to provide the necessary financial support. The annual dues were raised \$1 to provide these funds.

The following officers were elected for the ensuing year: Drs. Robert Sarde, Smyrna, president; W. C. Fetheroff, Centerville, president-elect; and E. F. Waller, Newark, secretary-treasurer. Drs. E. B. Daugherty, Delmar; Wm. Spence, Dover; and Wm. Schwartz, Wilmington, were elected for two-year terms to the executive committee.

S/E. F. WALLER, *Secretary.*

### District of Columbia

**Death of Mrs. Curtice.**—Mrs. Minnie K. Curtice, 88, wife of the late Dr. Cooper Curtice, died recently, after a long illness. Born and educated in Philadelphia, she was the daughter of the late Dietrich Wilhelm Klobe, prominent manufacturer of surgical instruments and artificial limbs. Dr. Curtice, who died in 1939, was noted for his work in eradication of the tick causing cattle fever and control of splenetic fever in cattle. A week before her death, Mrs. Curtice signed papers leaving her husband's manuscript collection to the Library of Congress.

Mrs. Curtice is survived by four sons and three daughters.

### Georgia

**State Association.**—The third semi-annual business meeting of the Georgia Veterinary Medical Association was held Dec. 7, 1952, at the Hotel Dempsey in Macon.

Three years ago, the business meeting was reported at the annual meeting, leaving the election of officers as the only business to be conducted during the annual meeting.

Following the usual business attendant to a veterinary association, the association took the following action: (1) voted to support the state civil defense program; (2) established a student loan fund, available to senior students at the University of Georgia, who are legal residents of Georgia, on the same basis as the Women's Auxiliary to the AVMA loan fund (loans are \$400 each); (3) subscribed to the AVMA Research Fund.

S/CHAS. C. RIFE, *Secretary.*

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**South Georgia and Chattahoochee Valley Associations.**—The Chattahoochee Valley Veterinary Association met in a joint session with the South Georgia Veterinary Medical Association in the Radium Springs Hotel, Nov. 23, 1952.

The program speakers included Drs. Carl Owen, D. A. Sanders, and L. A. Swanson of Gainesville, Fla. These men presented a highly interesting and profitable discussion of a wide variety of subjects in large and small animal



medicine. The program was of the audience-participation type in which various members of the meeting were called upon to give short discussions of topics brought up by the members of the panel.

The South Georgia Association elected the following officers: Drs. Shirley Shepard, Moultrie, president; Edwin King, Valdosta, vice-president; and Max B. Atwood, secretary. This Association voted to contribute \$50 to the AVMA Research Fund.

Officers of the Chattahoochee Association are: Drs. T. P. Culpepper, Marianna, Fla., president; E. T. Adams, Lake City, Fla., vice-president; and B. Lamar Watson, Chattahoochee, secretary-treasurer.

Following adjournment of the professional program, members of the associations and their wives enjoyed a smorgasbord dinner. Later, **Dr. C. C. Rife**, secretary of the Georgia Association, brought the group up to date on state association affairs.

*s/Max B. Atwood, Secretary.*

## Indiana

**Tenth District Association.**—On Dec. 11, 1952, the Tenth District (Ind.) Veterinary Medical Association met at the Westwood Country Club of Newcastle to hear **Mr. Paul Cyr** discuss world espionage.

**Dr. John T. Templeton**, McCordsville, was elected president; **Dr. Robert E. Miller**, Richmond, vice-president; and **Dr. F. O. Gossett**, North Salem, secretary-treasurer. **Dr. O. B. Curry** of Morristown was elected to the board of directors.

*s/J. L. Kixmiller, Resident Secretary.*

**Wabash Valley Association.**—At the December 10 meeting of the Wabash Valley Veterinary Medical Association, **Dr. J. T. Steffen**, M.D., of Wabash, discussed socialized medicine as he saw it in Europe. From his discussion of this important subject, it is evident that **Dr. Steffen** has made some good observations, indicating that even the poor did not benefit from socialized medicine.

Officers for this Association are **Drs. D. J. Myers**, Wabash, president; **R. M. Hafner**, Huntington, vice-president; and **H. A. Stevens**, North Manchester, secretary-treasurer.

After the professional program, the group sang carols and exchanged gifts.

*s/J. L. Kixmiller, Resident Secretary.*

## Iowa

**Officers of Small Animal Association.**—The Midwest Small Animal Association at its meeting in Burlington, Iowa, on November 13, elected as its officers **Dr. I. P. Irwin**, Iowa City, Iowa, president; **J. P. Coble**, Springfield, Ill., secretary; **Frank Booth**, Elkhart, Ind., vice-president; and **Wayne Riser**, Skokie, Ill.,

trustee. **Dr. J. M. McIlhny** of Omaha presided at the meeting. One of the speakers, **Dr. Lloyd C. Moss**, Fort Collins, Colo., announced that a special committee from the American Veterinary Medical Association is making a study of the animal hospital situation. He discussed the advantages of partnerships or groups of veterinarians operating combined large and small animal hospitals.

## Kansas

**Central District Association.**—The Central Kansas District Veterinary Medical Association met on Dec. 7, 1952, in the Lamer Hotel in Salina. **Dr. Marvin Twiehaus**, of Kansas State College, showed motion pictures and discussed briefly vesicular exanthema, rabies, and warfarin poisoning in dogs.

About 80 veterinarians and their wives met to enjoy dinner together. Between courses, **Mrs. Melvin F. Scoby** of McPherson, wife of the district trustee, led group singing of Christmas carols, with **Mrs. Gilbert W. Carl**, Abilene, at the piano.

*s/K. M. Curtis, Resident Secretary.*

**Southeast District Association.**—At the Dec. 9, 1952, meeting of the Southwest Kansas District Veterinary Medical Association in Chanute, the following speakers comprised the program: **Dr. John Harris**, state veterinarian, presented some of the highlights of the recent U. S. Livestock Sanitary Association meeting; and **Dr. J. A. Porter, Jr.**, district trustee, conducted a lively discussion on general practice problems.

Fifteen of the district veterinarians were in attendance.

*s/K. M. Curtis, Resident Secretary.*

## Kentucky

**State Association.**—The Kentucky Veterinary Medical Association met in the animal pathology building of the University of Kentucky on Dec. 11, 1952. Those who presented papers at this meeting were: **Drs. A. B. Poundstone** of the University faculty, and **Dr. Mark Welsh**, Lederle Laboratories, Pearl River, N. Y.

At the business meeting, a coordinating council for veterinary public health was organized to set up control programs for rabies and other diseases.

Approximately 175 attended the joint meeting of the annual conference for veterinarians at the University of Kentucky, and the meeting of the Kentucky V.M.A.

*s/T. J. Stearns, Secretary.*

**Conference for Veterinarians.**—The University of Kentucky's twenty-sixth annual conference for veterinarians was held in the animal pathology building on Dec. 10, 1952.

Members of the University faculty who participated in the program were **Drs. E. W.**



Thomas, C. A. Lassiter, and Durward Olds. Dr. C. F. Clark, dean of the School of Veterinary Medicine, Michigan State College, East Lansing, was the guest speaker.

The motion pictures "Bovine (Allergic) Dermatitis" and "Infectious Atrophic Rhinitis" were shown.

S/T. J. STEARNS, *Secretary*.

**Colonel Renshaw Retires.**—Colonel Solon B. Renshaw, Fort Knox, ended his thirty-five year Army career when he retired Nov. 30, 1952. Colonel Renshaw was commissioned in 1917, shortly after receiving his D.V.M. degree from Iowa State College. During World War I, he was stationed in France. Between wars, he was stationed at various posts inspecting meats and other foods and caring for horses and pets on the reservations.

In World War II, Colonel Renshaw inspected food in England and Africa. While his principal duties at Fort Knox were connected with food inspection, he was also responsible for other duties. As post game warden, he stocked the 100,000-acre reservation with deer, wild turkeys, and pheasant. He and Mrs. Renshaw will live on a 35-acre farm south of Fort Knox.

Lieutenant Colonel George A. Kuhn was transferred from Fort MacArthur, Calif., to take Colonel Renshaw's place.—*The Louisville Times*, Nov. 26, 1952.

## Massachusetts

**State Association.**—The regular monthly meeting of the Massachusetts Veterinary Association was held Dec. 17, 1952, at the Hotel Beaconsfield, Brookline. The guest speaker was Dr. Mark L. Morris, Hill Packing Co., Topeka, Kan., who discussed the diet of the sick dog.

S/C. LAWRENCE BLAKELY, *Secretary*.

## Michigan

**Southeastern Association.**—The following speakers appeared on the program of the December 10 meeting of the Southeastern Michigan Veterinary Medical Association at the Herman Kiefer Hospital: Dr. Jeness Eastman, Rochester, who discussed avianized distemper vaccine; Dr. G. Meyer, Detroit, who spoke on hormones in practice; and Dr. James P. McEvoy, Royal Oak, who presented a case report on diabetes in a cat.

S/S. KELLY, *Secretary*.

## Missouri

**Kansas City Association.**—On Dec. 16, 1952, the Kansas City Veterinary Medical Association met at the Hotel Continental in Kansas City, Mo., to hear Dr. Jake Fortenberry, of Cutter Laboratories, discuss viraccine, a new tissue culture immunizing agent against hog cholera.

Mr. Mathew Zilinskas, of California Spray Chemical Corp., presented a film on "Livestock Pest Control." Dr. K. M. Curtis gave a brief report on the medical-health civil defense conference held recently in Kansas City.

Officers for 1953 are: Drs. Fred B. Ogilvie, president; Thomas M. Eagle, vice-president; and James C. Davis, secretary-treasurer. The retiring president, Dr. Walter E. Dicke of Harrisonville, Mo., and the retiring secretary, Dr. K. M. Curtis of Kansas City, Kan., remain on the executive board for a year.

S/K. M. CURTIS, *Resident Secretary*.

## Dr. McGinty Receives Faculty Appointment.

—Dr. J. T. McGinty has been appointed to the faculty at the University of Missouri as an assistant professor in veterinary medicine and surgery. He is a 1949 graduate of Kansas State College and has been in private practice at Independence, Kan. Dr. McGinty will be primarily an ambulatory clinician.

S/A. H. GROTH, *Resident Secretary*.

**University's Model Dairy Farm.**—The University of Missouri announces the development of a model dairy farmstead 8 miles west of Columbia on Highway 40, which will be a home for the J. C. Penney Foremost Guernsey herd recently given to the university by Mr. Penney. The buildings, about completed, are modern, with a milk parlor of the elevated stall, pipeline milker type.

## Nebraska

**State Association Officers.**—The following officers were elected at the fifty-sixth annual convention of the Nebraska Veterinary Medical Association: Drs. F. O. Lundberg, Wausa, president; E. L. Metcalfe, Dewitt, vice-president; W. T. Spencer, Lincoln, secretary-treasurer; C. E. Brillhard, Madison, and H. L. Church, Battle Creek, were elected to the Board of Directors; and Paul Matthews, Omaha, was elected resident secretary of the AVMA.

S/ORDELLA GEISLER, *Secretary*.

## New Brunswick

**Canadian Auxiliary.**—The third annual meeting of the Ladies' Auxiliary to the Canadian Veterinary Medical Association was held at the Algonquin Hotel, St. Andrews by the sea, N. B., on Sept. 16, 1952. Mrs. E. L. Brown of Moose Jaw, Sask., president, welcomed 180 members from all parts of Canada. Greetings and reports were submitted from nine Canadian provinces. All showed records of interest and support for the national auxiliary.

Mrs. H. S. MacDonald of Toronto, Ont., secretary to the Ladies' Auxiliary to the C.V.M.A., and president of the Women's Auxiliary to the AVMA, brought greetings from the

North American group. She stressed the need for wider horizons for our auxiliaries and urged the support of all members at provincial, national, and international levels. Mrs. A. E. Coombs, third vice-president of the Auxiliary to the AVMA, presented auxiliary visitors from the United States.

The following officers were installed: Madame J. H. Veilleux, Quebec City, P. Q., president; Mrs. J. F. R. Barton, Chilliwack, B. C., first vice-president; Mrs. J. F. Frank, Sackville, N. B., second vice-president; Mrs. J. Dunn, Kamloops, B. C., third vice-president; Mrs. Alfred Savage, Winnipeg, Man., secretary; and Mrs. L. Choquette, Macdonald College, P. Q., treasurer.

The social part of the meeting was friendly and interesting. Members of the Maritime Auxiliary were hostesses for a delightful tea. There were luncheons, banquets, and a tour of St. Andrews handicraft shops which are famous for their woolen goods, after which members enjoyed a visit to the Van Horne estate on Ministers Island.

s/MRS. ALFRED SAVAGE, *Secretary*.

### New Mexico

**State Association.**—The annual meeting of the New Mexico Veterinary Medical Association was held in Carlsbad, on Oct. 6-7, 1952.

Out-of-state veterinarians who addressed the convention were **Drs. E. M. Baldwin**, Omaha, Neb.; **W. O. Brinker**, East Lansing, Mich.; and **Charles L. Davis**, Denver, Colo.

Other speakers who participated in the program were **Drs. John E. Abbott** and **C. F. Doty**, host veterinarians; **E. E. Kraus**, Clovis; **S. J. Dowds**, president, Tucumcari; and **O. J. Rollog**, Albuquerque.

The new officers of the association are **Drs. Norman M. Borthwick**, Roswell, president; **O. J. Rollog**, Albuquerque, vice-president; and **Joe M. Miller**, Alamogordo, secretary-treasurer.

Highlights of the social activities included a dinner dance at the Crawford Hotel Ballroom and a tour of the famous Carlsbad Caverns.

s/JOE M. MILLER, *Secretary*.

### Pennsylvania

**Bucks-Montgomery Association.**—**Dr. John Mills**, School of Veterinary Medicine, University of Pennsylvania, discussed clinical pathology (with illustrations) at the Dec. 10, 1952, meeting of the Bucks-Montgomery Veterinary Medical Association in Doylestown.

s/VINCENT W. RUTH, *Secretary*.

**Keystone Association.**—On Dec. 3, 1952, the Keystone Veterinary Medical Association met in its new meeting room in the new portion of the north wing of the University of Pennsylvania School of Veterinary Medicine. **Dr. Bettylee Hampil**, director of virus research at Sharpe &

Dohme, Inc., West Point, discussed rabies; and **Dr. Ernest J. Witte**, chief veterinarian for the Pennsylvania Department of Public Health, Harrisburg, discussed the current status of rabies in the state.

s/RAYMOND C. SNYDER, *Secretary*.

### Vermont

**Tri-County Association Organized.**—This meeting was called by **Dr. James Wadsworth**, Department of Animal Pathology, University of Vermont, on Sept. 22, 1952. It was decided that meetings would be held in February, May, and September of each year. Furthermore, it was decided that the chairmanship would be rotated and that the meetings would be of a social and educational nature. Ten veterinarians were present and **Dr. R. O. Fournier** of Burlington was chosen as chairman for the next meeting.

s/W. B. DURRELL, *Resident Secretary*.

### Wisconsin

**Northeastern Association.**—The Northeastern Wisconsin Veterinary Medical Association met at the Belmont Hotel in Green Bay, Oct. 22, 1952. **Mr. L. L. Mohlke**, president of the West Side State Bank of Green Bay, was the dinner speaker. **Dr. R. Finkle** entertained the group with his magic.

Common cattle diseases was the subject for the panel discussion.

The following officers were elected: **Drs. D. Funderburg**, Oconto Falls, president; **K. Downey**, Green Bay, vice-president; **William Madson**, Appleton, secretary; **H. R. Trombley**, Appleton, treasurer; and **Q. Metzger**, Oshkosh, trustee.

s/WILLIAM MADSON, *Secretary*.

### Wyoming

**Poll Veterinarians on Brucellosis Program.**—Wyoming veterinarians were polled on the question of continuation or termination of the present state brucellosis-control program. The vote was evenly divided. Many who voted for its termination indicated that they would vote to have it continued if the compensation were increased and the method of supplying the brucellosis vaccine was made the responsibility of the local practitioners.

s/J. F. RYFF, *Secretary, State Association*.

## FOREIGN NEWS

### Austria

**Seminar on Animal Diseases.**—Veterinarians, public health workers, and laboratory experts in five leading animal diseases attended a five-day seminar in Vienna last November. It was the first United Nations scientific conference held in the Austrian capitol.

## Iran

**Dr. Rastegar Visits AVMA Office.**—Dr. Reza Rastegar, head of Iran's Biological Institute, University of Teheran in Teheran, visited the AVMA office on November 4.

Iran's only college of veterinary medicine, at the University of Teheran, requires six years of training and graduates about 25 men annually. They are given very little clinical training since their duties are expected to be chiefly diagnosis and disease control. Anthrax, rinderpest, blackleg, and sheep pox are among the threatening diseases, and vaccination is the only enforceable method for their control. Most of the vaccinating of the herds and flocks is done under veterinary supervision by lay vaccinators who have been given either a six-month or a two-year training course, depending upon the responsibilities to be assigned them.

## Iraq

**Dr. El-Dabbagh Awarded FAO Fellowship.**—Dr. Mohammed Abdullah El-Dabbagh, veterinary inspector of Iraq, will take up a fellowship awarded by the Food and Agriculture Organization of the United Nations. Dr. Dabbagh will study protozoology and parasitology for one year at the London School of Tropical Medicine and Hygiene and at the Parasitology Division of the Veterinary Laboratory of the Ministry of Agriculture, Weybridge, England. On his return to Iraq, he will serve as parasitologist in the Veterinary Laboratory. This is the first of four fellowships which may be awarded by FAO to veterinary laboratory workers in Iraq.

## MARRIAGE

Dr. (UP '40) Barney Spielholz, Maplewood, N. Y., and Miss Irene Perlmutter, were married on Nov. 9, 1952, in Newark, N.J.

## BIRTHS

Dr. (TEX '50) and Mrs. Don T. Balentine, Alvarado, Texas, announce the birth of a daughter, Donna Diane, on Aug. 7, 1952.

Dr. (TEX '51) and Mrs. Thomas F. Ryan, Forrest City, Ark., announce the adoption of a daughter, Jean Miller Ryan, who was born Sept. 13, 1952.

Dr. (COR '51) and Mrs. G. M. Christensen, Minot, N. Dak., announce the birth of a daughter, Barbara Elsa, on Oct. 16, 1952.

Dr. (WSC '36) and Mrs. Fleetwood R. Koutz, Columbus, Ohio, announce the birth of Harold David, their third son, on Oct. 30, 1952.

Dr. (TEX '51) and Mrs. T. W. Matthews, Luling, Texas, announce the birth of a son, Robert Alan, on Nov. 9, 1952.

Dr. (OSU '51) and Mrs. Paul J. Myers, Jacksonville, Fla., announce the birth of a daughter, Corrine Celestine, on Nov. 13, 1952.

Dr. (MO '50) and Mrs. Harold W. Pilcher, Gashland, Mo., announce the birth of a son, Thomas Wayne, on Nov. 12, 1952.

Dr. (OVC '32) and Mrs. E. Wayne Baldwin, Alford, Iowa, announce the birth of a daughter, Lynda Lea, on Nov. 23, 1952.

Dr. (OSU '42) and Mrs. R. F. Baker, Spencerville, Ohio, announce the birth of a son, Bruce Daniel, their fourth child, second son, on Dec. 1, 1952.

Dr. (ISC '49) and Mrs. A. R. Skewes, Union Grove, Wis., announce the birth of a daughter, Martha Rene, on Dec. 7, 1952.

Dr. (ISC '42) and Mrs. C. D. Van Houweling, Elmhurst, Ill., announce the birth of a son, Dirk Alan, on Dec. 25, 1952.

## DEATHS

**George R. Allen** (ONT '08), Worthington, Ind., died Oct. 31, 1952. Dr. Allen was a general practitioner.

**James E. Assing** (AVC '92), 85, New York, N. Y., died Nov. 23, 1952. Dr. Assing retired in 1940 after fifty years as veterinarian on the New York City Board of Health. He is survived by his widow and a daughter.

**Charles Backer** (UP '02), Milford, Conn., died recently. Dr. Backer had retired from practice.

**Ben J. Baker** (KCV '08), 82, Lincoln, Neb., died Oct. 10, 1952. Dr. Baker had lived in Lincoln for twenty-two years. He is survived by his widow and two sons.

**E. C. Baker** (GR '10), 73, Larned, Kan., died Oct. 9, 1952. Dr. Baker served in the Veterinary Corps of the U. S. Army during World War I. He is survived by his widow, a son, a daughter, and a grandson.

**J. C. Barbee, Jr.** (CVC '12), 62, Rice Lake, Wis., died Aug. 30, 1952. Dr. Barbee worked for the state and federal governments. He is survived by his widow, a son, and a step-daughter.

**\*C. B. Barber** (COL '30), 57, Lawrenceburg, Ind., died Sept. 7, 1952. Dr. Barber, who was employed by the U. S. Bureau of Animal Industry, was admitted to the AVMA in 1931. He is survived by his widow.

**O. E. Barr** (ONT '08), 63, Barre, Vt., died of a heart attack on Aug. 30, 1952. Dr. Barr had practiced in Barre for forty-four years.

**\*George Barry** (SF '17), 59, Albion, Calif., died Oct. 17, 1952. Dr. Barry was health inspector for Alameda for ten years and was then appointed sanitarian for the Mendocino Coast

\*Indicates members of the AVMA.

area and later for the entire county, which position he held at the time of his death. Dr. Barry is survived by his widow and four children. He was a member of the California Veterinary Medical Association and of the AVMA.

**William A. Belding** (ONT '11), 67, Boyne Falls, Mich., died Sept. 5, 1952. Dr. Belding had practiced in Pigeon until shortly before his death. While in Pigeon, he was active in civic affairs. He is survived by his widow, two daughters, and five sons, two of which, Sherl A. (MSC '41), Pigeon, and Theodore (MSC '44), Lansing, are veterinarians.

**Allen P. Buck** (OSU '11), 71, Fresno, Calif., died Aug. 18, 1952. Dr. Buck had practiced in Boone and Grand Junction, Iowa, until 1942 when he retired.

**Homer Christman** (IND '12), Findlay, Ill., died in June, 1952. Dr. Christman was a practitioner.

**\*Burnett L. Clarke** (CVC '95), 84, Monticello, Wis., died in May, 1952. Dr. Clarke was a member of the Wisconsin Veterinary Medical Association and was admitted to the AVMA in 1911.

**John F. Connors** (HAR '99), 76, South Boston, Mass., died Oct. 30, 1952. Dr. Connors had retired as veterinarian for the city of Boston in 1946.

**\*William C. Cullen** (MCK '14), 63, Mankato, Minn., died of a coronary occlusion on Sept. 14, 1952. Dr. Cullen had practiced veterinary medicine for nearly forty years, thirty-one of which were in Mankato. He is survived by a son, Dr. W. Clough Cullen, also of Mankato.

Dr. Cullen was a member of the Minnesota and Southwestern Minnesota Veterinary Medical Societies and of the AVMA.

**Lewis A. Dibert** (CVC '11), Cullom, Ill., died in June, 1952. Dr. Dibert was a general practitioner.

**M. C. Fitzwater** (GR '06), 69, Cherokee, Okla., died recently. Dr. Fitzwater was a general practitioner. He had been a member of the AVMA.

**R. E. Hittle** (ONT '08), 57, Philadelphia, Pa., died May 4, 1952. Dr. Hittle was a general practitioner.

**O. C. Hopkins** (STJ '12), 81, St. Joseph, Mo., died Nov. 6, 1952. Dr. Hopkins is survived by a daughter, a granddaughter, and two great grandchildren.

**C. F. LaBar** (MSC '19), 61, Ypsilanti, Mich., died Oct. 7, 1952. Dr. LaBar was a general practitioner. He is survived by his widow and three daughters.

**Garry V. McBride, Jr.** (COR '40), 37, Slingerlands, N. Y., died Oct. 22, 1952. Dr. McBride, whose wife preceded him in death, is survived by four children, his parents, and a brother.

**G. L. McClain** (COL '10), Denver, Colo., died recently. Dr. McClain had retired from

practice to devote his time to his real estate business.

**Edward Alexander McCullough** (CVC '94), Delavan, Wis., died during 1952. Dr. McCullough had been a member of the AVMA.

**\*A. T. Olson** (GR '18), 58, Granville, Wis., died in September, 1952, of a heart condition. Dr. Olson was a member of the Wisconsin and Southeastern Wisconsin Veterinary Medical Associations, and of the AVMA.

**R. B. Raymond** (CVC '11), Mauston, Wis., died in 1952. Dr. Raymond was a general practitioner.

**W. H. Schneider** (MCK '17), Lancaster, Wis., died in May, 1952.

**John J. Spielman** (UP '16), 61, Torrington, Conn., died Sept. 27, 1952. Dr. Spielman had practiced in Torrington for thirty-six years. He is survived by his widow and two sons.

**John E. Wilkins** (IND '09), 78, Wolfe City, Texas, died recently. Dr. Wilkins was a member of the Texas Board of Veterinary Medical Examiners and was once a member of the old Mayo College in Commerce. He had resided in Greenville for more than fifty years but moved to Wolfe City in 1951. He is survived by his widow, a son, a daughter, four grandchildren, and 1 great grandchild.

**Frank C. Van de Steeg** (KCV '12), Sauk Centre, Minn., died July 27, 1952. Dr. Van de Steeg was employed by the Minnesota Live Stock Sanitary Board.

• • •

The following deaths have been reported as a result of the National Scientific Register survey. The usual information for an obituary was not supplied.

**William D. Allison** (MCK '19), East Dubuque, Ill.

**Charles A. Bliss** (CVC '10), Osborne, Kan.  
**Elliott D. Bowes** (MCK '12), Brandon, Man.  
**Homer D. Campbell** (CIN '09), Forest, Ohio.  
**Rufus D. Denton** (CVC '07), Tuscola, Ill.

**A. E. Des Rosiers** (MON '10), Nicolet, Que.  
**W. L. Johnston** (API '44), Fairfield, Ala.  
**Horace P. Keely** (UP '92), Schwenkville, Pa.  
**Louis Kohl** (STJ '15), Odell, Neb.

**F. W. Loomis** (ISC '92), Shannon City, Iowa.

**Henry E. Marshall** (ONT '96), Toronto, Ont.  
**John H. Morse** (UP '04), Sumter, S. Car.  
**Walter F. Pfeiffer** (CVC '18), Plymouth, Wis.  
**Arthur E. Rude** (CVC '07), Davenport, Wash.

**August H. W. Siewert** (MCK '20), Jawas City, Mich.

**E. M. Stein**, Elmwood, Wis.  
**Thomas L. Taylor** (GR '04), North Lewisburg, Ohio.

**William Voss** (CVC '96), Kiel, Wis.  
**W. P. Weaver** (USC '05), Stroudsburg, Pa.  
**E. W. Weeces** (KCV '18), Osmond, Neb.  
**H. P. Zimmerman** (MCK '10), Elgin, Ill.

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## COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Texas, State Veterinary Medical Association of. Annual meeting. Baker Hotel, Mineral Wells, Texas, Jan. 26-27, 1953. Al Price, 101 Veterinary Anatomy Building, College Station, Texas, executive secretary.

Minnesota State Veterinary Medical Society. Annual meeting. Nicollet Hotel, Minneapolis, Minn., Jan. 26-28, 1953. B. S. Pomroy, St. Paul 1, Minn., secretary.

California State Veterinary Medical Association. Midwinter Annual meeting. Davis, Calif., Jan. 26-28, 1953. W. J. Zontine, 1014 Yucca Ave., Lancaster, Calif., program chairman.

North Carolina Veterinary Conference. North Carolina State College, Raleigh, N. Car., Jan. 27-29, 1953. C. D. Grinnells, North Carolina State College, Raleigh, chairman.

Illinois State Veterinary Medical Association. Annual meeting. Hotel Sherman, Chicago, Ill., Jan. 28-30, 1953. A. G. Misener, 6448 North Clark St., Chicago 26, Ill., secretary.

Louisiana State University. Annual conference for veterinarians. Louisiana State University, Baton Rouge, La., Feb. 3-4, 1953. W. T. Oglesby, head, Department of Veterinary Science.

Connecticut Veterinary Medical Association. Hotel Bond, Hartford, Conn., Feb. 4, 1953. Niel W. Pieper, Middletown, Conn., resident secretary.

Veterinary Medical Association of New Jersey. Annual meeting. Essex House, Newark, N. J., Feb. 5-6, 1953. J. R. Porteus, P. O. Box 938, Trenton, N. J., president.

Colorado A. & M. College. Annual conference for veterinarians. Colorado A. & M. College, Fort Collins, Colo., Feb. 16-18, 1953. O. R. Adams, director of veterinary clinics.

Missouri Veterinary Medical Association. Annual meeting. Hotel Jefferson, St. Louis, Mo., Feb. 23-24, 1953. J. L. Wells, P. O. Box 676, Kansas City, Mo., secretary.

Alabama Veterinary Medical Association. Annual meeting. Reich Hotel, Gadsden, Ala., March 19-21, 1953. M. K. Heath, Alabama Polytechnic Institute, Auburn, Ala., secretary.

Northern Illinois Veterinary Medical Association. Spring meeting. Faust Hotel, Rockford, Ill., April 15, 1953. J. W. Boller, Harvard, Ill., secretary.

Oklahoma conference for veterinarians. School of Veterinary Medicine, Stillwater, Okla., May 11-12, 1953. D. M. Trotter, professor and head, Department of Veterinary Pathology, chairman.

International Fertility Association. World conference. Henry Hudson Hotel, New York

City, May 25-31, 1953. Chairman, Local Arrangements Committee, 11-65th Ave., New York 29, N. Y.

Kentucky Veterinary Medical Association. Annual meeting. Seelbach Hotel, Louisville, Ky., July 8-9, 1953. T. J. Stearns, Room 216, Live Stock Exchange Building, Louisville, Ky., secretary.

American Veterinary Medical Association. Annual meeting. Royal York Hotel, Toronto, Ont., July 20-23, 1953. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Pennsylvania State Veterinary Medical Association. Annual meeting. Hotel William Penn, Pittsburgh, Pa., Oct. 14-16, 1953. R. D. Snyder, Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

(Continued on p. 28)

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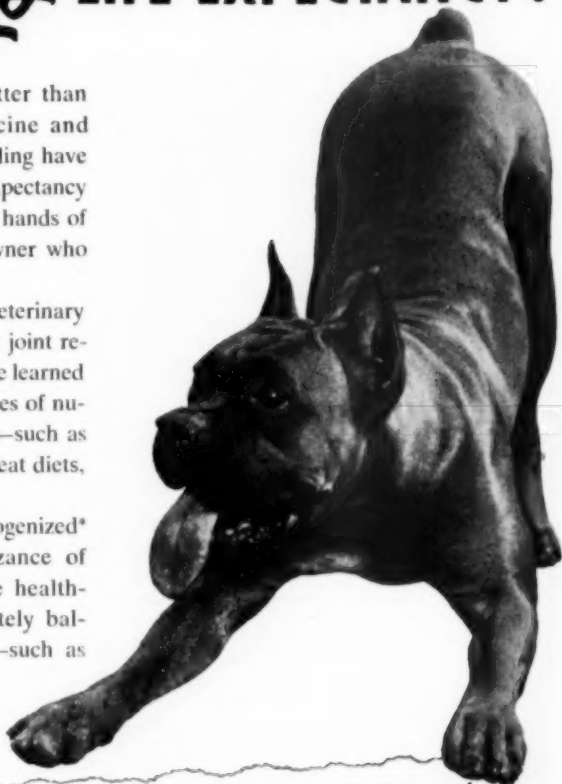


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(COMING MEETINGS—continued from p. 26)

**Regularly Scheduled Meetings**

Bay Counties Veterinary Medical Association, the second Tuesday of each month. David E. Madsen, 44 South 4th St., San Jose, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month (except July and August) at Black's Tea Room, Waterloo. F. E. Brutsman, Traer, Iowa, secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. W. E. Smith, 516 Oatman, Sanger, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. Mr. Earl D. Adams, Greensboro, N. Car., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Coastal Bend Veterinary Association (Texas), the second Wednesday of each month. J. E. Hoban, 4301 S. Port Ave., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. V. D. Ladwig, Sac City, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month—September through May (except January)—at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Roger W. Grundish, 4217 Mayfield Road, South Euclid 21, Ohio, secretary.

East Bay Veterinary Medical Association, bi-monthly, the fourth Wednesday. Robert Clemens, 23352 Orchard, Hayward, Calif., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Florida, North-East Florida Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. J. O. Whiddon, 829 San Marco Blvd., Jacksonville, Fla.

Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. George A. Franz, 3667a Marceline Terrace, St. Louis, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month.

(Continued on p. 30)



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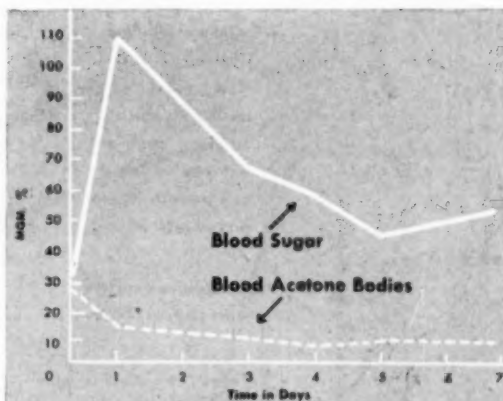
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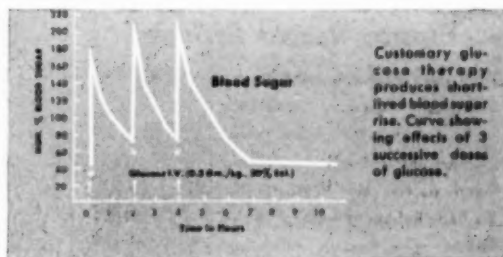
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(COMING MEETINGS—continued from p. 28)

Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Sunday evening of even-numbered months at the Jefferson Hotel, Peoria, Ill. S. M. McCully, Lacon, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. E. M. Lang, 716 E. Broadway, Louisville, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. T. M. Eagle, Parkville, Route 2, Mo., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, in the Hotel Continental, 11th and Baltimore, Kansas City, Mo. K. M. Curtis, 70 Central Ave., Kansas City 18, Kan., secretary.

Kern County Veterinary Medical Association, the first Thursday of each month. Richard A. Stiern, 17 Niles St., Bakersfield, Calif., secretary.

Keystone Veterinary Medical Association, the Philadelphia County Medical Society Building, 301 S. 21st Street, Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Karl Mayer, 1531 Fourth Ave., Huntington, W. Va., secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from September through May, at the Academy of Medicine of Northern New Jersey, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at Hotel LaSalle, South Bend, Ind. Bruce Hostrawser, 2621 Mishawaka Ave., South Bend, Ind., secretary.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

(Continued on p. 32)

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(COMING MEETINGS—continued from p. 30)

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. C. Edward Taylor, 2146 S. Broad St., San Luis Obispo, Calif., secretary.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month at the Hotel Admiral Simmes, Mobile, Ala. C. Eric Kennedy, Mobile, Ala., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. C. Edward Taylor, 2146 South Broad St., San Luis Obispo, Calif., secretary.

New Castle County Veterinary Society, the second Wednesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Harold Roberts, Paper Mill Road, Newark R3, Del., secretary.

New York City, Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63 St., New York City. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday evening from September through June, at the Casa Mana Restaurant, Cedar Lane, Teaneck, N. J. Robert R. Shomer, 1680 Teaneck Road, N. J., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Tom Hagan, Gen. Del., Escalon, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. W. C. Schilb, 4312 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Clark Stillinger, 1742 E. Holt Ave., Pomona, Calif., secretary.

Orange County Veterinary Medical Association, bi-monthly. Donald E. Lind, 2643 N. Main, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. P. H. Hand, Box 1035, Millbrae, Calif., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. C. N. Copeland, Hickory, N. Car., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month,

(Continued on p. 34)



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- in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.
- Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. Robert L. Hawley, 1001 N. W. Fourteenth Ave., Portland, Ore., secretary.
- Redwood Empire Veterinary Medical Association, the third Thursday of each month. H. M. Strandberg, 203 D St., Petaluma, Calif., secretary.
- Roanoke-Tar (N. Car.) Veterinary Medical Association, the first Friday of each month, time and place specified monthly. B. H. Brow, Weldon, N. Car., secretary.
- Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. S. M. Foster, 430 College, Woodland, Calif., secretary.
- Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. H. W. Harper, Flint Health Department, Flint, Mich., secretary.
- San Diego County Veterinary Medical Association, the fourth Tuesday of each month. Warren J. Dedrick, 904 S. Lemon, El Cajon, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary Medical Association, the second Friday of even months. Joe Ridgway, 1784 Thompson Blvd., Ventura, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. R. W. Sprowl, 11756 San Vicente Blvd., Los Angeles 49, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. A. Majilton, 1093 N. E. 79th St., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, in Director's Parlor of the Brookside State Bank, Tulsa, Okla. John Carnes, Muskogee, Okla., secretary.

### Foreign Meetings

Fifteenth International Veterinary Congress. Stockholm, Sweden, Aug. 9-15, 1953. Dr. L. de Blicke, Soestdijkseweg 113N., Bilthoven, Netherlands, secretary, Permanent Committee. (U. S. Committee: Dr. W. A. Hagan, N. Y. State Veterinary College, Ithaca, N. Y., chairman; Dr. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., secretary.)



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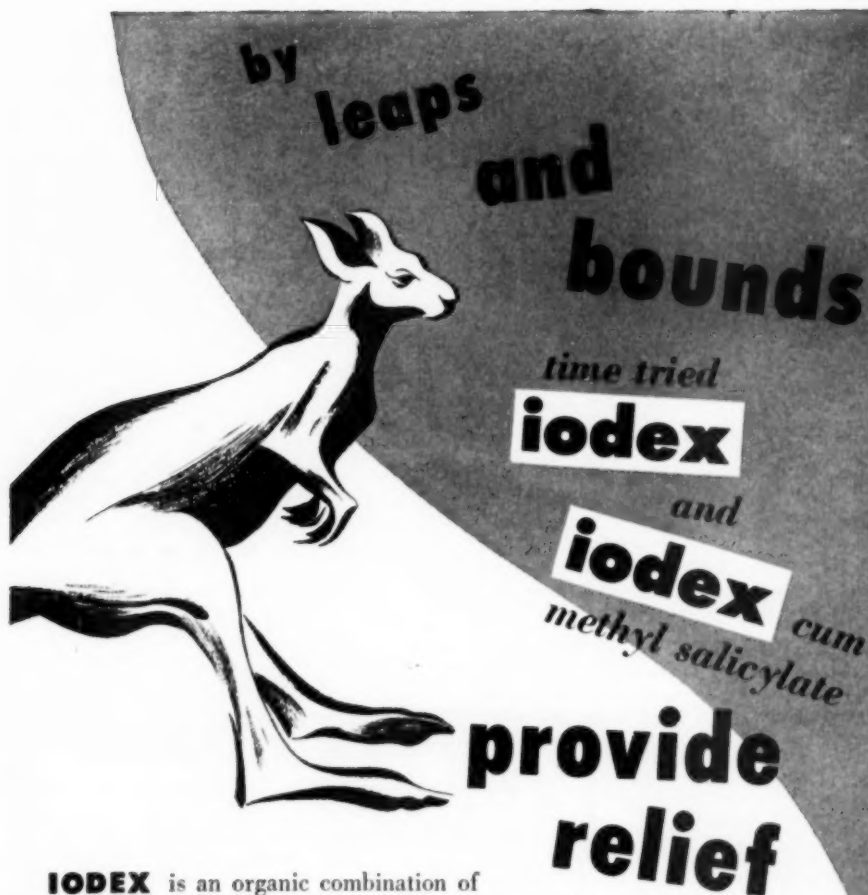
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(Continued on p. 38)

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1. Finapke, S. A. and DeCamp, D., *Vet. Med.*, November 1950.      2. *Ibid.*

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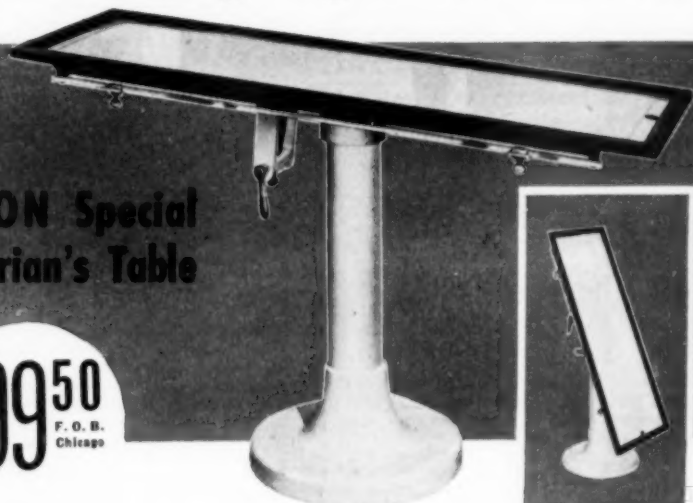
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(Continued on p. 40)

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(Continued on p. 42)



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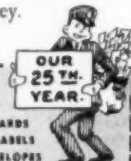
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(CLASSIFIED ADS—continued from p. 40)

**WANTED**—mixed practice in Ontario. Will buy now or will work with older practitioner who will retire within three years. Canadian. Married. Address "Box D 14," c/o JOURNAL of the AVMA.

### For Sale or Lease—Practices

**FOR SALE OR LEASE**—with option to buy. Southern California small animal hospital now at one man capacity. No real estate. Low price lenient terms. Address "Box W 17," c/o JOURNAL of the AVMA.

**FOR SALE**—well-established small animal practice in one of the choice spots in central coastal California. Practice built on careful work. Is not recommended for an inexperienced man, but would be a pleasant practice for the right man. \$15,000 includes all equipment, normal operating inventory, and long lease on buildings. Address "Box B 5," c/o JOURNAL of the AVMA.

**FOR SALE**—mixed practice in central Georgia grossing \$20,000 and growing. Practically no hogs. Hospital, 5-room apartment, 2-way radio, fluoroscope, and all equipment, \$18,500. Address "Box D 1," c/o JOURNAL of the AVMA.

**FOR SALE**—mixed practice in Southwest city of 30,000, grossing over \$22,000. No real estate. Price \$7,500, \$3,000 down. Owner going into Service. Address "Box D 6," c/o JOURNAL of the AVMA.

**FOR SALE**—new brick hospital in southern state. Winters mild, practice not strenuous. 70% small animals; big future in dairy work. Net \$10,000 first year. Very little early morning and night work. \$12,500 to handle, balance \$150 per month. Address "Box D 7," c/o JOURNAL of the AVMA.

**FOR SALE**—active, well-established 60-40 small and large animal practice. Located on spacious, beautifully landscaped grounds in South Carolina's fastest growing city. Modern brick hospital, waiting room, office, examination and surgery, bathing and feeding, x-ray and dark room, kennels and runs. Modern brick home, 3 large bedrooms, den, 2 baths, living room, dining room, kitchen. Excellent opportunity at \$40,000. Address "Box D 8," c/o JOURNAL of the AVMA.

(Continued on p. 44)

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## Vitamins Saved Them



*Above*—Pigs before treatment. Average weight approximately 19 pounds at 70 days of age. *Below*—Same pigs 34 days after intraperitoneal injection with a vitamin mixture comprising niacin, thiamine, riboflavin, pantothenic acid, and pyridoxine, followed by a good ration supplemented with the same vitamins.

THE pigs shown above were taken from 11 Michigan farms and were treated at the Michigan Agricultural Experiment Station. They are among 80 malnourished pigs treated with B vitamins supplied by Merck. Of that number, 69 survived and grew and 11 died, most of them in the first week.

Details of the treatment are given in *Michigan Technical Bulletin 211*, published by the Michigan Agricultural Experiment Station. The authors state: "The results of this study clearly indicate that outbreaks of certain types of swine enteritis in weanling pigs are due solely to nutritional deficiencies." They add that this form of enteritis occurs far more frequently than is generally recognized.

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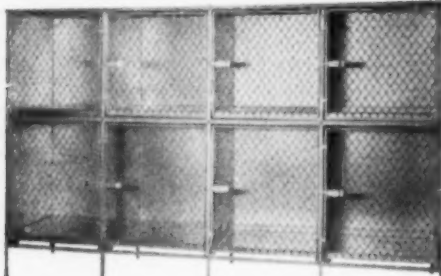


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(CLASSIFIED ADS—continued from p. 42)

**FOR SALE**—well-established small animal practice, excellently located in suburban Philadelphia. House, kennels, equipment, and valuable ground included in sale. For further details write Chandler & Canning, Inc., Cheltenham, Pa.

**FOR SALE**—beautiful new ranch style home with clinic. Mixed practice; expansion unlimited. Southern California resort town. Sell for real estate value; no blue sky. Terms. Address "Box D 11," c/o JOURNAL of the AVMA.

**FOR SALE**—established Baltimore dog and cat hospital with over \$30,000 gross. Opportunity to continue large animal and race horse practice in conjunction if desired. Hospital fully equipped; will sell with or without real estate. Must sell due to illness in family which forces me to move out of state. Opportunity for one or two veterinarians. This is the most modern animal hospital in Baltimore (one-million population). Completely air-conditioned. Perfect working conditions for energetic veterinarian. Contact Dr. E. I. Nesterke, 1818 E. Fayette Street, Baltimore 31, Md. Phone Eastern 2100.

**FOR SALE**—outstanding small animal hospital. Unusual, highly efficient floor plan provides an easily worked hospital with smooth traffic flow of clients and animals. Completely equipped with twin examining rooms, 4 wards, 98 inside cages, 22 outside concrete runs. Excellent location main highway outskirts large southern California coastal city. Rapidly growing area. Ideal climate. Address "Box D 15," c/o JOURNAL of the AVMA.

**FOR SALE**—large animal veterinary practice. Includes new house, garage with attached office, drugs, and instruments. Practice has netted \$500 to \$600 a month for three years. Total price \$11,500, \$3,500 cash, balance F.H.A. Address "Box D 16," c/o JOURNAL of the AVMA.

**FOR SALE OR LEASE**—with option to buy, modern, fully equipped small animal hospital located in fast growing community of Maryland. Address "Box D 18," c/o JOURNAL of the AVMA.

### Remittance must accompany order

**FOR SALE**—completely modern, 50-kennel small animal hospital in Rocky Mountain region. Established seven years. Also facilities for large animal hospitalization and surgery. Other interests reason for selling. Address "Box D 21," c/o JOURNAL of the AVMA.

**FOR SALE OR LEASE**—with option to buy full partnership. Well-established mixed practice in one of the choice spots of the Bluegrass region of Kentucky. Excellent 5-room modern small animal hospital completely equipped. Three bedroom ranch-style home connecting hospital through breezeway. Located on a beautifully landscaped half-acre plot of

(Continued on p. 46)

40 years of service to the veterinary field



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# He Asked Permission to Stay

*Major William E. Barber, USMC*

*Medal of Honor*



**E**IGHT THOUSAND weary marines lay besieged at Yudam-ni; three thousand more were at Hagaru-ri, preparing a breakthrough to the sea. Guarding a frozen mountain pass between them, Major Barber, with only a company, held their fate in his hands. Encirclement threatened him; he was ordered to withdraw. But he asked permission to stay, and for five zero-cold days the company held the pass against attack. The Major, badly wounded, was carried about on a stretcher to direct defense. When relief came, only eighty-four men could walk away. But Major Barber's action had been decisive in saving a division.

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**Cobalt**—essential for Vitamin B<sub>12</sub>—guards against loss of appetite, permits maximum body gains and helps maintain normal level of hemoglobin in the blood.

**Manganese**—necessary for successful growth, reproduction, lactation and bone development.

**Iodine**—to help prevent simple goiter.

**Iron**—essential as part of hemoglobin to every organ and tissue of the body.

**Copper**—necessary with iron for hemoglobin formation.

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Recommend that Blusalt be kept before farm animals at all times—and mixed with feed according to directions on the bag.



### STERLING TRACE-MINERAL BLUSALT

100-lb. bags  
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4-lb. lks

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Scranton, Pa.

(CLASSIFIED ADS—continued from p. 44)

ground and fronting one of the busiest four-lane highways in the state. Owner entering military service. Phone or write Dr. L. M. Roach, Frankfort, Ky.

#### Miscellaneous

**DOG BREED BOOKS**—\$3.50 each: Boxer, Boston, Chihuahua, Springer, Dachs, Dane, Peke. Keep up on dogs through *Dog World* magazine, \$3, year; 5 yr., \$10. Judy Publishing Co., 3323 Michigan Blvd., Chicago 16, Ill.

Dr. Fritz Volkmar, 1929 Irving Park Rd., Chicago 13, Ill., wishes to exchange his veterinary medical bookplate (*ex-libris*) with that of other veterinarians. Correspondence invited.

Summer vacation camp for July or August, 1953. Maine, beautiful location on lake, private. Owned by a veterinarian. Early reservation necessary. Address "Box C 6," c/o JOURNAL of the AVMA.

**FOR SALE**—former M.D.'s office well suited small animal hospital. No veterinarian in area. Wonderful opportunity! Write to J. C. Penner, 248 Central, Shafter, Calif.

**BOVINE PROLAPSE PREVENTER**—Payton UTERO-VAGINAL Prolapse Preventer. Quickly, easily applied to any size cow. Positive protection. Re-usable, nonirritating, sanitary. Noninterference with placenta release. Excellent for vaginal protrusion; dispensing. See article JOURNAL of the AVMA, December, 1951. Only \$2.00 prepaid. Dr. Jerome Payton, Morris, N.Y.

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(Continued on p. 47)

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2 teaspoonfuls daily per 25 pounds body weight is usually sufficient to provide minimum daily requirements of trace minerals plus other minerals and vitamins. For puppies, kittens, fox pups and toy dogs—1/4 to 1/2 teaspoonful daily is adequate.

For kennel use, may be mixed 1 or 2 pounds with each 100 pounds of regular feed.

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### Received Too Late to Classify

**WANTED**—two veterinarians to assist in mixed practice. Modern facilities. Salary and commission. Guarantee \$5000 per year. Give complete qualification in first letter. Address Paducah Animal Clinic, 3027 Jefferson, Paducah, Ky.

**WANTED**—position in small animal or mixed practice. Mixed practice experience. 29 years old, Draft exempt. Address "Box D 22" c/o JOURNAL of the AVMA.

**WANTED VETERINARIAN**—to manage small animal practice, Chicago area. Salary can be on percentage or monthly basis if so desired. Address "Box D 24," c/o JOURNAL of the AVMA.

Being called into Service soon. Will lease mixed practice and equipment for modest rental or sell outright. No real estate involved. Excellent climate and opportunity for financial gain. Address "Box D 25," c/o JOURNAL of the AVMA.

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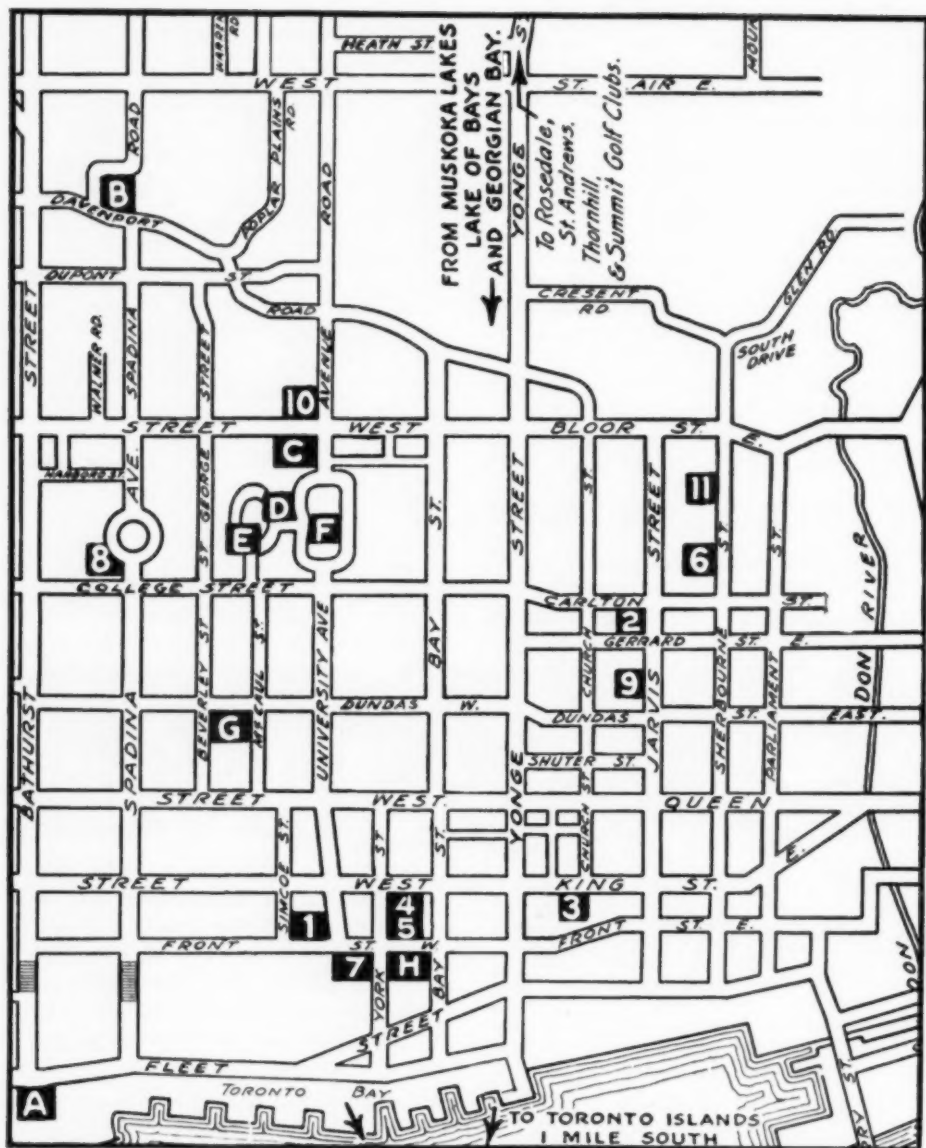
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- C. Royal Ontario Museum
- D. Hart House

- E. University of Toronto
- F. Parliament Buildings
- G. Art Gallery of Toronto
- H. Union Station

# HOTEL RESERVATIONS — TORONTO CONVENTION

Ninetieth Annual AVMA Meeting, July 20-23, 1953

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

HOTELS AND RATES			
HOTEL	SINGLE	DOUBLE	TWIN BEDS
1. The Barclay	\$4.50 up	\$5.00-8.00 up	\$7.50-8.50 up
2. Frontenac Arms	\$6.00	\$8.00	\$8.00 up
3. King Edward	\$5.50 up	\$9.50 up	\$10.25 up
4. Prince George	\$4.50 up	\$6.50 up	\$6.50 up
5. Royal York	\$7.50 up	\$11.50 up	\$11.50 up
6. St. Regis	\$5.50-6.00	\$7.50 & 8.50	\$8.50 up
7. Walker House	\$4.00	\$7.00	\$7.00
8. Waverley	\$3.50 up	\$6.50-7.50	\$7.00
9. Westminster	\$5.00 up	\$6.00 up	\$6.00 up
10. Park Plaza	\$7.00-9.00		\$10.00
11. Selby	\$3.50	\$5.00-6.00	
Motor Hotels (Motels)			
		Single	Double
12. The Guild Inn (5 mi. east of Toronto)		\$6.50	\$9.00
13. Alda Motel (about 10 mi. east of Toronto)			\$7.00
14. Lido Motel (about 10 mi. east of Toronto)			\$8.00
15. Sunnyside Motor Hotel (Lake Shore Rd. at western entrance to Toronto)			\$9.00

Cut Off Here

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